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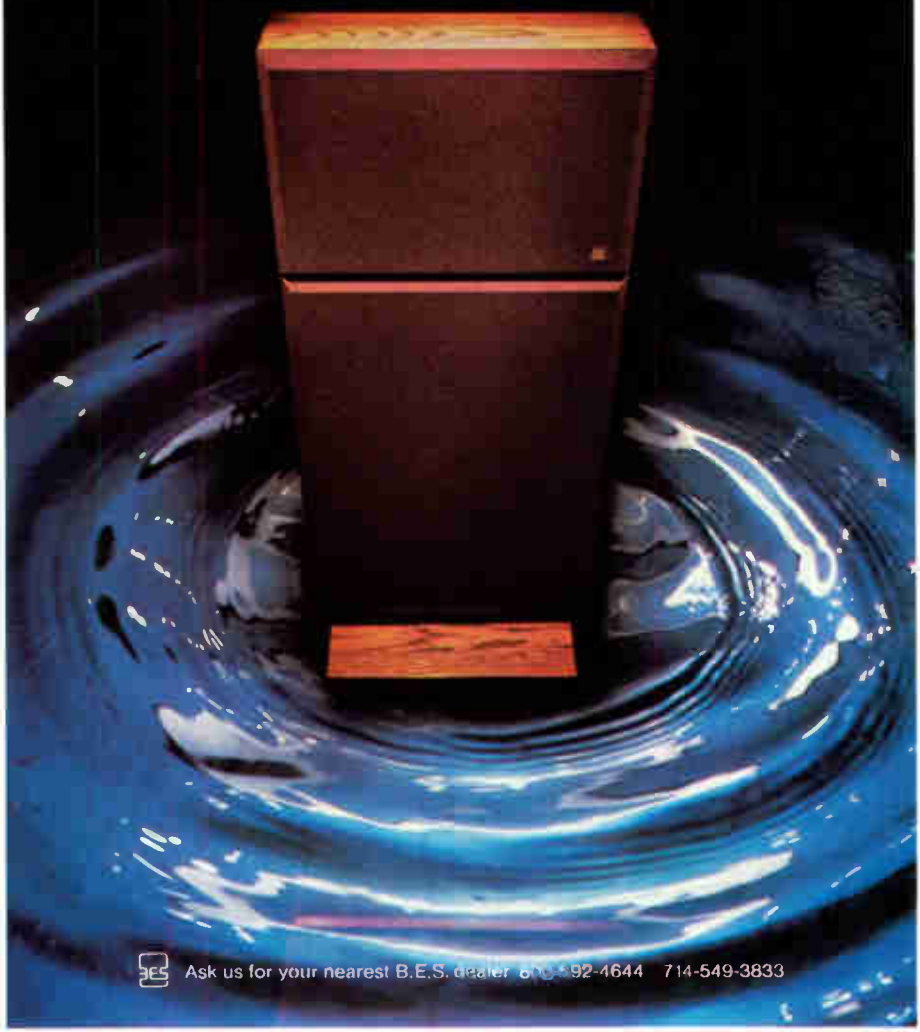

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THE SECOND SENSE

J. Gordon Holt

When it comes to video, most audiophiles are insufferable snobs. These normally reasonable people, who are among the first to admit that great sound in a motion picture theater makes a great film much more enjoyable, nonetheless scoff at the very idea of augmenting their own sound with images, or of trying to create the kind of audio-visual experience in their home that they routinely enjoy at the cinema. Doing that involves video, which they equate with TV, which they equate with LCD[1] dross. This is unfortunate, because visuals can enhance good sound, and good sound can do wonders for non-TV video programs like Hollywood motion pictures.

This issue of *Stereophile* debuts a new department: Video. It is a small department, occupying no more than a few pages per issue. To introduce this new department, I am going to talk about our reason for allowing this bold intrusion into our hallowed high-end-audio pages.

We all know that listening to well-reproduced music by itself can be a delightful experience. Audio alone brings us the essence of the music—its sound—without irrelevant images and the the varied distractions of an audience: the coughs, the crinkling candy wrappers, the whispered conversations, rustling programs, and the overweight lady nearby radiating a miasma of cheap perfume. Audio is an art form unto itself, not necessarily better than, but very different from, the real concert-hall experience. But just as a recording session allows for the control of acoustical phenomena, providing music without extraneous audio experiences, a well-made video recording of a musical event limits the visual presentation to those aspects which enhance the music. It is a different art form, having its own unique capability to please the senses.

So-called pop videos such as Michael Jackson's "Thriller" and Michael Nesmith's "Elephant Parts," and the manic mini-spectaculars used on MTV to promote record album sales, have established sight-with-sound as The New Music Medium for the Masses. But classical-music videos—of operas and concerts—have thus far not found acceptance by most "serious" music listeners. This would be okay if listeners had tried the A/V medium of music presentation, and found they didn't care for it; the fact is, however, that most have never experienced it and thus don't know what they're missing. What they're missing is the potential for greatly enhanced enjoyment.

For movie buffs, the wedding of high-quality video with high-quality sound can offer even greater benefits. Few of us will deny that good sound in a movie theater enhances the impact of the film. Yet few realize how much better the average home audio system is than the average cinema sound system. Try to recall the last blockbuster film you saw in a theatre, and the awesome low end that came off its soundtrack. If truth were known, that "awesome" bass actually had a lower limit of about 50 Hz! That's right; 50 Hz is the design cutoff frequency for all but the most ambitious movie-theater sound systems. And very few of the sound tracks themselves are even recorded to below 40 Hz. (Those floor-shaking rumblings in the film *Earthquake* were actually generated by the low-pass-filtered output of a pink noise generator, and special Cerwin-Vega subwoofers had to be installed in the theaters where the film was shown. Some theaters were so unaccustomed to that kind of low end that they actually shed

1 Not Liquid-Crystal Display, but Lowest Common Denominator.

plaster onto the paying customers.)

And those sparkling movie theater highs? Few such systems produce anything worth sniffing at above 5 kHz! That's what audiophiles think of as "middle highs." Yet most modern film soundtracks are flat to around 10 kHz, and some go well beyond that. That's hardly perfectionist-type high-end range, but it's a helluva lot better than most of us have ever heard in popcorn heaven.

But there are also ways in which cinema sound is better than most home audio. For one thing, it sounds *bigger.* A theater is a large performing space, with a typical reverb time approaching that of a concert hall, and for that reason the sound is usually mixed dry—with little reverb of its own. The theater space does the rest. At home, the film sound track sounds as dead as it actually is. That's called "fidelity to the recording," but it is *not* the way the recording is meant to be listened to.

Then there are the theatrical film's surround-sound effects, which seem to expand the action beyond the limits of the screen by producing certain effects from behind us. Both the proper theater sound and the surround sounds are usually missing from the home listening environment, but they need not be. We have ways. . .

Most Hollywood films released with stereo soundtracks for home viewing are actually encoded with the surround-sound information you hear in the theater. All it takes is a decoder and a couple of extra speakers and amps, and you get the surround effects in your home. When Indiana Jones is being pursued by angry natives, you hear their shouts approaching from behind you. Ambience synthesizers, which create the illusion of a reverberant space from dry recordings, have been available for years, and are particularly valuable in making film soundtracks sound the way they were intended to.

Many audiophiles argue that they will not try video with their sound because of the size disparity. They tend to think of video as a tiny picture, and conjure mental images of a grotesque conflict between this teensy image and the Cinemascope spaciousness of our reproduced sound. In fact this discrepancy often exists, and is one of the things that must be considered when adding images to sounds. Watching an automobile travel 14 inches across a screen when its audible image travels 8 feet between loudspeakers, is not only distracting but ludicrous. Yet even though audiophiles are far more aware of stereo-image directionality than the average theatergoer, even we tend to be more forgiving of imaging accuracy when our eyes can see the"sources" of the imaged sounds. The visual sense takes precedence over the aural, so even though all the dialogue in many films is mixed to occupy the center of the movie screen, we nevertheless "hear" it as coming from the person we see speaking on the screen.

But when the picture size and soundstage size correspond, and both are *big*, the effect can be stunningly realistic. That congruity is best accomplished via a large-screen video projection system, but there are other less costly and space-hogging ways of achieving the same result with a small screen.

As a serious audiophile, you already own half of what it takes (and possibly the most expensive half) to enjoy the benefits of a mixed-media home entertainment system. If you already own a videocassette or videodisc player, and haven't tried piping its audio through your system, you're in for a very pleasant shock when you try it for the first time. There is, for example, low end on many prerecorded videocassettes (and most TV broadcasts) that you've probably never been aware of. It is filtered out by the average TV speaker as effectively as if it went through a third-order Butterworth high-pass filter.

I'm not suggesting that *Stereophile* readers take up another hobby. What I am suggesting is that the addition of video to your audio system will open up a whole new world of sheer enjoyment to you. That's why we are starting a video department in *Stereophile*: to help you assemble an A/V system that will give this kind of pleasure. **JGH**

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LETTERS

AURAL ADJUSTMENTS

Editor:

In reading articles about high-end, high-cost equipment, it is necessary to keep one's mind on the end result: what our ears hear. *Not* what we read about, see in a picture, or feel when manipulating knobs or buttons. There is an oft-forgotten law of nature which bears repeating: The ear (and its complex mechanism) quickly adjusts itself to anomalies of frequency response and dynamics, to give the listener the impression that the sound is as perfect as it can be.

I am very familiar with the sounds of many pipe organs, yet I find that practicing on my 2-manual, 6-rank reed organ at home gives me the same aural and physical pleasure that I would get from playing or listening to a large pipe organ. There is an adjustment period, but it is short. It is especially useful to the person who does not have a fine taste for quality sound reproduction, but it is also at work to a different degree among those of us who appreciate fine audio. Nature is indeed resourceful.

My point? Do we really need a $35,000 speaker system or a $1000 cartridge, and so on? Are we not kidding ourselves in this age of high tech, high biz and high hype?

Roger Berube
Nashua, NH

In listening to reproduced sound, familiarity does indeed breed contentment.

Ironically, the more a person is exposed to live music, the more tolerant he is of imperfections in reproduced music. Despite continuing improvements in reproduced fidelity, literally accurate sound reproduction is still far from being possible. There are always countless differences between the real thing and the reproduction of it, so the perception of reproduced sound as being "realistic" requires a certain suspension of one's critical faculties. This is most easily accomplished by those listeners whose familiarity with live sound is so great that aural memory takes over where fidelity leaves off. Knowing confidently how things should *sound makes it easy for the mind's ear to fill in the gaps between the actual and the ideal.*

By the same token, those people whose preference for reproduced over live sound results in their getting little exposure to the latter need the most literally accurate sound reproduction they can get. Lacking the memory of perfection, they must rely on their system to provide what their mind cannot.

ARM LIFT

Editor:

Several months ago I wrote to you asking your assistance in locating a cueing device for my tonearm, but you were unable to help.

I have since located a source for such devices, and thought other readers might be interested. The device is called the AL-2 Auto Lift, and it is made by Supex.

L. V. Rypka
Owatonna, MN

Sumiko, who imports Supex, reports that the AL-2 is no longer in their product line, though it might possible be available from Supex in Japan. Contact your favorite Japanese hi-fi store, or possibly give Sumiko a call at 415-843-4500.

QUESTIONS

Editor:

What causes colorations in loudspeakers? Every system seems to have its own characteristic timbre.

What is a "near-sota" speaker?

Mobile Fidelity's discs have phenomenal middle and low-end sound but there seems to be something the matter with their high end. Do you agree? If so, what might cause this?

I owned a pair of Bose 901s some time ago and could never get them to sound as good as many lower-priced speakers. Aside from "spatiality," what is wrong with this speaker?

What does the word *angst* mean? I can't find it in my dictionary.

Since your magazine has been in business for more than 20 years, I am curious to know why it isn't as well-known and widely sold as *Audio*, and is still considered to be an "underground" magazine. I find your magazine to be of exceptional quality.

Anthony Mauldin,
Lewisville, TX

Very briefly and a little simplistically, colorations in loudspeakers are the result of frequency-response irregularities, which in turn are caused by resonances (every material has its own vibrational "fingerprint") and by partial cancellation at certain frequencies due to phasing interference.

A "near-sota" speaker is one that is almost good enough to be called State-of-the-Art, but isn't quite.

We don't agree about Mobile Fidelity discs. Like all recordings, M-F's vary in high-end quality depending on the HF quality of the original masters, but we have never observed any consistent pattern that might suggest that anything might be "wrong."

Besides producing gratuitous spatiality, we found the Bose 901 (as of many years ago) to be rather badly colored and conspicuously "slow"-sounding, as if it sheared off transients. We have not tested a recent 901.

Angst *is a German word meaning "profound mental torment or suffering," probably from the same roots as "anguish."*

Two reasons we are neither as successful nor as visible as Audio: Audio *has been around for more like 40 years, and has from the beginning accepted and solicited advertising. Because advertising revenues are more or less directly related to circulation, it has been profitable over the years for* Audio *to spend a lot of money acquiring circulation and generally making themselves visible.*

BETTER MAT

Editor:

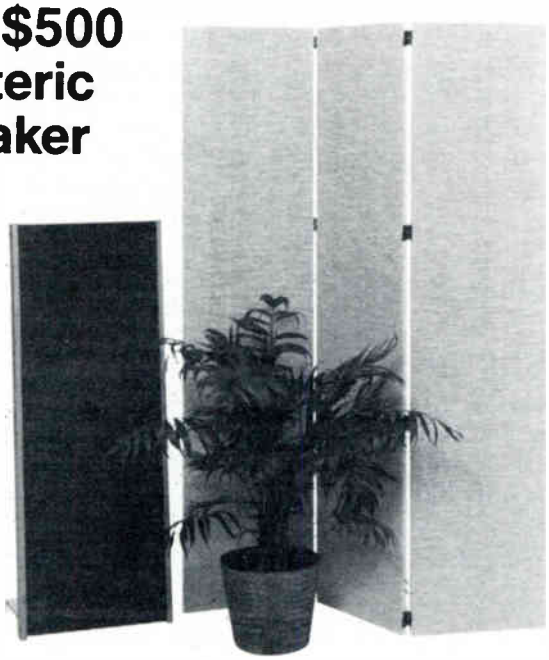
I have a Sansui FRD4 turntable with an Audio Technica AT-130E cartridge. Do you think a better platter mat might improve my sound?

Lowell Yena
S. Milwaukee, WI

Almost certainly. The standard mats on relatively budget turntables do almost nothing to absorb the vinyl resonances set up in records by the action of the stylus passing through the groove. Which one will be the best for your system is very difficult to say; you'll have to experiment with mats to find the one which best complements your current colorations. Other details can be important, such as bonding the mat securely to the turntable platter and using a clamp to bond the record to the mat. Use of a record weight is not recommended for budget turntables since their bearings are probably just up to the job of supporting the platter.

Acoustic feedback—which is often

The $500 esoteric speaker



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more of a problem with medium-priced amplifiers than with the costliest ones—is affected by how well vibrations of the entire disc surface (rather than just the area around the stylus) are damped, and this depends on how intimately the surface contacts the underlying surface and how effectively that surface can absorb the vibrations. If a disc is dished upwards in the center the underlying surface has little effect on damping anything.

LASER MUSIC

Editor:

I read *Stereophile*'s enthusiastic reviews of several laservideo discs of classical music, which I assume were reviewed through the Pioneer LV player, so I was quite dismayed to read the following in *High Fidelity* for December '83: "A more serious and persuasive drawback is the noise—a chugging sound—generated by the machine itself, Pioneer's top-of-the-line LD-1100." The writer went on to point out that there is apparently no way of preventing this noise, and no way of silencing it, as placing it in isolation would render the 1100's remote control useless.

What do you have to say about this?

Kenneth Lausa
Lima, OH

The Pioneer LV players do produce a "chugging" sound, but only when in Pause mode. We have not observed it while playing a disc, but it is possible that some players do make chugging noises then. But the noise is very quiet and, as long as you don't sit on top the player, should not be audible when there is any *program on. We had our player, an LD-660, located five feet from the listening seats, and could hear it "chugging" very faintly while paused, but could never hear anything from it while listening to a program. Unfortunately, unlike the LD-1100 the LD-660 has no remote control, so if you intend to diddle wih its fast-shuttle and freeze-frame controls while viewing, it must be placed within arm's reach, where a continuous whirring noise will be audible during quiet parts of the program. No chugs, though.*

If a player is audible while playing, and even if you cannot locate it far enough away to get rid of the noise, most listeners would get used to it in a minute or so and ignore it thereafter simply because it is a constant background. Anyone who is driven up the walls by such things can mute the noise by locating the player behind a sheet of glass or clear plastic, with a padded (but ventilated) enclosure around the player if further noise reduction is required. (This is the same kind of nut who drives audio dealers to distraction by returning perfectly good preamplifiers because he can hear hiss with the volume control cranked full-up.) The LD-1100's infrared remote-control signals will penetrate a transparent barrier such as glass, so HF's *contention that the player cannot be effectively isolated is incorrect.*

Unfortunately, the Pioneer players have a more serious audible problem, which we hear as a series of 60-Hz spikes, and which sounds like intercarrier buzz. It comes from the 60-Hz vertical sync pulses which leak through into the audio, and is annoyingly audible during quiet musical passages. We haven't been able to eliminate it in our player.

A MODEST PROPOSAL

Editor:

I would like to propose an experiment which could provide data bearing on the question of the correctness, or lack thereof, of Compact Disc sound.

You and your staff have the knowledge and experience to produce a CD from live material, and to do it *right*. By being intimately involved with the per-

formance and the recording, you would be well qualified to pass judgment on the accuracy of the system, in comparison with both the master tapes and the performance itself.

Cost should not be a problem. As I understand it, a run of 1000 CDs can be produced from a digital master for less than $5 per disc, so if you set the price at, say, $10 per disc to cover costs (including payment of some musicians) and put out the call to *Stereophile* readers, you should be able to finance the project. If one reader out of 20 is willing to ante up $10 in the cause of science (and get a reference CD for their money), the project will fly. If the response is inadequate, extend the subscriptions of those who send money and just forget the whole thing.

Larry Geary,
Parlin, NJ

We have in fact been thinking, not too seriously, of just such a project. Now that you've prodded us to think more seriously about it, we'll put it to our readers.

How many of you would be willing to pay, say, $10 for a CD of mostly-musical material that has been completely un-gimmicked and is as natural-sounding as we know how to make it? DON'T SEND MONEY now. All we want is a letter or postcard, addressed to CD Project at this address, with a simple "Yes." If your answer is "No," don't write; we just want a count of Yeas.

If we went through with this, the game plan would be as follows: We would take the $10 contributions and hold them in escrow until there was enough funding to proceed. If there was not enough response, contributors would be given the choice of a refund or of having their subscriptions extended.

Note that the recording would probably not *be "state-of-the-art" because, while JGH (who would be producing the disc) has had many years of recording experience, he has neither the experience nor the microphones of a Doug Sax. We would of course use the best commercially available mikes we can lay our hands on, but otherwise the recording would simply be free of the kind of gimmicking or laxness that has plagued most CD releases to date.*

There's another alternative for you: get ahold of some of Sheffield's recent releases on CD and compare them to their analog-disc equivalents. Depending on a hell of a lot of things (whether the CD was cut from Sheffield's digital or analog backups, what your phono system is like, what preamp you use), you may be able to form an accurate opinion about the contributions of the CD process—which according to Philips will be none at all. (Even though we support CD, we don't believe that.*)*

LIVE RECORDING

Editor:

Although I am a near-charter subscriber to *Stereophile*, I have only recently discovered how much fun it is to make live recordings. Of course, the lack of interesting recordable performances has been partly responsible for my late emergence into the recording arena. Be that as it may, when I tried to do some research into recording techniques and equipment I was amazed at how little information is available on the subject. One of the most useful sources of information that I was able to unearth was the few articles in *Stereophile* about your recording experiences and your reviews of recording equipment. Rather than continue to search vainly for additional references, I'd like to request your assistance in learning the basics of this art.

My particular interest is in recording classical groups of varying sizes at concerts. This requires a minimalist microphone technique, which usually produces the most natural sounding recording anyhow. My equipment consists of a Tandberg TD-20A SE (high-speed version) and a pair of AKG C-460 microphones with interchangeable cardioid and omni capsules. I've tried a variety of mike placements, all using the cardioid capsules in order to minimize audience-noise pickup. Additionally, I have attempted to avoid any equalization or other alterations of my recordings. The groups I've recorded so far include a full symphony orchestra, a large chorus with chamber orchestra, several chamber groups, and some unaccompanied soloists. The resulting recordings have been rather variable; some have turned out quite nicely, while others have been mediocre. Also, the spectral balance of several of the recordings has been on the bright side, presumably because of the inherent low-frequency rolloff of cardioid mikes combined with the AKG's slightly rising high-end response.

I would like to be able to predict more reliably what microphone placements would produce optimum results in the differing acoustical environments I encounter. This is especially important since I must frequently set up and record "cold," in unfamiliar recording environments and without a chance to ascertain recording levels or experiment with mike placement. Any suggestions you can give me will be appreciated.

Vade Forrester
San Antonio, TX

Even experienced professionals find it hard to "predict" what a recording made under unfamiliar circumstances will sound like. This is one reason why multitrack recording is so popular; it facilitates control of unpredictable variables, after the fact.

Two of the best recording texts available are The Recording Studio Handbook, *by John Woram ($39.50) and* The Microphone Handbook, *by John Eargle ($28.60). Both are available from Elar Publishing, 1120 Old Country Rd., Plainview, NY 11803. These can take you just so far, though. Beyond what you'll learn from them, there's no substitute for experience.*

It would appear that your biggest problem now is your microphones. No matter how good your placement technique, you'll never get natural-sounding recordings from colored mikes. Look into some others, paying close attention to their published frequency-response curves, and remember that it's better for a mike to have some high-end rolloff than an equal amount of high-end rise. It takes very little to turn cymbals and massed violins into steely hardness.

A BOUQUET FOR MCINTOSH

Editor:

I want to add my own comments to yours on the subject of McIntosh components.

Regardless of the company's policies

towards the testing of their products, McIntosh has always made superb equipment, with excellent quality control—which can't be said for many manufacturers in any industry today, audio or otherwise.

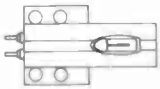
Whether a company is big or small is not the issue. It's the dedication to produce quality products that counts. Let's hope the audio market can support both, for the benefit of the consumer.

L. Amoroso,
New York, NY

Not having tested any of their equipment for many years, we cannot pass judgment on the sonic quality of McIntosh's products. We do agree that quality control is important. But there are plenty of other, smaller audio-component manufacturers which are not only equally dedicated to maintaining high standards of QC and reliability, but have also shown a willingness to let their products be critically compared with the competition, by vol-

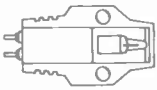
Now that you've taken it home ... does your moving coil cartridge sound better than the sales pitch that convinced you?

Ours will!



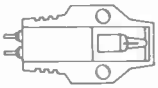
TITAN

MC cartridge
Titanium cantilever
Air-core armature
OFC coil winding
Super elliptical stylus
Anti-resonant sandwich body
0.25 mV output



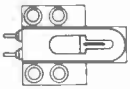
Saphic

MC cartridge
Laser cut sapphire cantilever
Line-contact stylus
0.25 mV output



mV2.5

High output mc cartridge
Sapphire cantilever
Parabolic stylus
OFC coil winding
2.5 mV output



RED

MC cartridge
Boron or Sapphire cantilever
Microridge stylus
OFC coil winding
Machine cut Almg body
1 mV output (Boron)
0.2 mV output (Sapphire)

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untarily submitting them for review by magazines such as Stereophile. *McIntosh has in fact indicated a willingness to loan us components for testing; all we had to do was ask. We have asked, and will be reviewing some of their products in upcoming issues.*

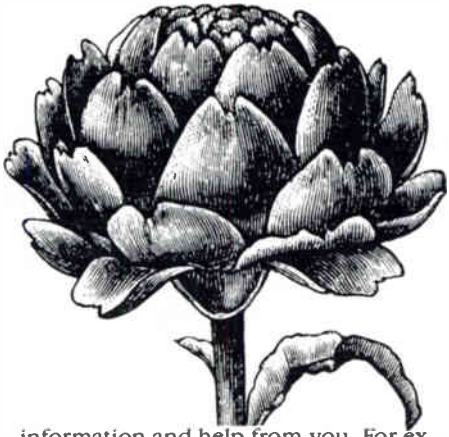
I WISH I WERE A "BEAUTIFUL PERSON"

Thank you for the article "7 Budget Speakers" in Vol. 7 No. 4. I may not be the only "poor devil" in the *Stereophile*'s subscribers list that cannot qualify for membership in the "beautiful people club" constantly mentioned by the Mondale-Ferraro duo as beneficiaries of Reaganities (I am neither in the real estate trade nor managing old ladies' trust funds). Maybe now that your subscribers went from 3,000 to over 15,000 the "poor devils" are more numerous than the "beautiful" ones and we will see more evaluations devoted to the "underdogs."

I tell you that my mouth has been driveling, issue after issue, reading the wonders of amplifiers capable of levitating a heavyweight music lover (recliner included) to aphrodisiac delights. Not to mention $43,000 loudspeakers, turntables costing as much as a Mercedes-Benz, and some esoteric cartridges with cantilevers made of lapiz lazuli from the very coffin of Tutankhamen, glued with the nasal secretion of bi-sexual Himalayan cockroaches suffering antiphlogistic disease and wearing a wooden leg. All these wonders at prices a "poor devil" must run to his nearest Savings & Loan for, to get a second mortgage in order to enjoy music!

Anyway, I thank you folks for the change! Recently you have been evaluating equipment at "realistic" prices (nothing to do with Radio Shack!) affordable to the average American bread-earning music lover, i.e. the AR turntable ($300), MAS-282 tone arm ($169), B&K ST-140 power amp. ($395), and Carver TX-11 tuner ($549).

Going back to the "7 Loudspeakers Under $500," I confess that I devoured the article, as well as some other recent evaluations of affordable speakers. Indeed the Metronome 11, Dayton Wright LCM-1, Spica TC-50, Fourier 6, Rauna Tyr and Phase-Tech PC-60 seem to be outstanding in their price range. However, this "p.d.", and I guess other subscribers too, badly need *additional*



information and help from you. For example, Metronome II increased its price to $650, where it hits Thiel 04 right on the nose. Besides, the Metronome 11 requires stands at an additional $75 a pair. It seems the Thiel 04 will get the green light. Don't you agree?

The Spica is $79 cheaper than the Dayton Wright and the Fourier 6, yet these three are about the same performance-wise. Some are better than the others in certain ways or vice-versa. However, the lack of bass of the Spica and the DW require a subwoofer, which is not essential for the Fourier. This makes the Fourier the winner. Do you agree?

Now we come to the Tyr and the Phase-Tech PC-60 that are selling at a meager $5 difference. Your (JGH) own report about the Tyr is very enthusiastic. The little Tyr seems to do everything very well and needs no subwoofer. However Dick Olsher (DO) says regarding the PC-60 that their lower range beats the pants off the present competition and the separate subwoofer offered by Phase Tech does not make a night-and-day difference. Since the items mentioned are almost identical in performance and

price, maybe availability will account for the final decision. On this matter—if my personal experience with Phase Tech is valid—there is little hope for any of us to get any of the items you recommended!

Here is my case. Being myself closer to Jacksonville, Florida, than to San Clemente, California, I wrote to Phase Tech requesting information about *local* dealers, or to quote me a direct sale price. A week after I received a sheet of paper listing a dealer on the other coast of Florida, Fort Myers (maybe they mixed up the "Forts") and annother in Miami. The latter would have been fine, but what the good souls at Phase Tech did not know was that the Miami store has been defunct for over a year!

But this is not the end of the story! Obstinately I tried the (800) 874-7076 number given by *Stereophile* but this number is not valid for Florida. Pertinaciously I put my pennies to work and called (904) 777-0700. After talking to four different persons and repeating the same thing, like a broken phonograph record, I was sharply told that disregarding the fact that there is no dealer around (300+ miles) they will not even quote me the price of the equipment.

Anyway, *Stereophile* subscribers are taught not to buy speakers without first listening to them (preferably in their own music room), so I made the realization that my choices are quite narrow: just what's locally available!

Back to the evaluated speakers. They are recommended as good in the price range, but you clearly state they don't compare with the $1000 + speakers. Then my last question! In the opinion of *Stereophile* what speakers represent a good buy in the next price range? For example, I just read about the Boston Acoustic A-400 ($900 pair), has *Stereophile* evaluated it?

Well, Chief Holt, I am enthusiastic about the way you prepare your reports (calling "a spade a spade"). I renewed my subscription, and am throwing several wishy-washy magazines to the "you know what." I am determined to get for myself a good speaker, even if I have to persuade my mother-in-law to let me take her wedding ring to the pawnbroker!

Thank you again, Chief Holt, and keep the good work!
O. A. D.
Florida

We'll start last first. Good luck with your mother-in-law (it was for her sake that we didn't publish your name).

At present we have no firm recommendation in the $1000+ price range, but here are some hints: a favorable report is upcoming on the Euphonic Nymph; the Vandersteen IIC is a perennial favorite, but Richard Vandersteen is adamant about not sending us a review sample and there's no local dealer; the Fuselier 3.3 is an excellent speaker though as yet unheard in Santa Fe (see Vol. 7 No. 5); and Spica is coming out with a self-powered subwoofer (remember, you heard it here first) which should make their system superb, for about $1000.

We've forwarded your letter to Phase Tech and hope you receive a more positive response. But we have no control over distribution of the speakers we review; we can only advise persistence. Local availability and a quality dealer are always *an important factor, particularly with some products (tape decks, tuners, turntables and tonearms).*

The speakers reviewed favorably in Volume 7, Number 4 are not *"the same performance-wise"; they are simply of equivalent value. Each of these speakers has a "personality," to which yours will undoubtedly respond in different ways. The purpose of the report was to give you an idea of the strengths and weaknesses of all the speakers, so you could know where to look. We cannot tell you what to buy.*

We will continue to survey less expensive equipment; the very expensive stuff can *be superb, but many people who love to listen to music simply can't afford it. Our ambition is to find the golden nuggets at all price ranges, but don't count on them being available at your corner hi-fi store, however.* **LA**

SOMMERWERCK IN THE SUMMER Part II

William Sommerwerck

SHOWSTOPPERS: NEW YORK AUDIO LABS

If William Zane Johnson (of Audio Research Corporation) is the unapproachable Emperor of Vacuum, then Harvey Rosenberg of New York Audio Labs must be the Court Jester of Valves. Resembling a middle-aged Elton John, and sporting an enormous pair of strawberry-colored eyeglasses, he put on a record of reggae-flavored music and started dancing. Quite well, in fact.

"How many manufacturers do you know that will dance for you?," he asked.

"Well, I've known quite a few that will go into a *song* and dance," I replied.

NYAL is the heir to Julius Futterman's classic Output Transformer-Less (OTL) vacuum tube designs. At the very end of his life Futterman wanted to pass along his engineering expertise to others. The design of his amps required careful parts selection to keep the amp from self-destructing. Futterman clung to life until NYAL finally produced a working unit—and then died that afternoon, apparently having fulfilled his life's ambition.

Since then, NYAL has concentrated on improving the Futterman design. I'm not sure how much the circuitry itself has been altered, but there have been big improvements in the power supplies. The amps aren't cheap (running from $2600 to $9000), but the demand is so great that they sell as fast as they're made. NYAL has introduced two new products which could easily triple their unit sales. To understand the new design philosophy, we have to examine Julius Futterman's work before he died.

Futterman felt that the characteristic sound of an amplifier was determined principally by the devices used in the low-level stages. If a transistor amp sounded nasty or 2-dimensional it was due to the input and driver stages, and not so much to the output devices. This suggested to Futterman that MOSFETs (which, after all, have characteristics much like those of tubes) could be substituted for the output tubes and still keep most of the sound quality of the all-tube amp.

Futterman died before he could design a practical circuit, but NYAL has developed such a circuit, and it's used in two new amps, the Moscode I and II. (The name refers to the use of a vacuum-tube cascode circuit to drive the MOSFET output stage.) The Moscode I can deliver 150 W/ch into an 8-ohm load, 225 W/ch into 4 ohms. The larger II supplies 400 W/ch into 4 ohms, and includes vacuum tube regulation of the input circuitry. They are priced at $900 and $1600, respectively.

If I'm to judge by what I heard at the show, the sound is superb. At all times it was utterly effortless and unstrained, without a hint of grit, grain or dryness. These amps are both exceedingly sweet *and* well-detailed, with good focus and presence. They do not have the dull, rounded-off sound one associates with inferior tube gear, nor was there any trace of hardness. They should be capable of driving the low-impedance electrostatic designs that the all-tube Futtermans cannot handle, and one can expect to see NYAL's market penetration greatly increase.

NYAL also plans to release a digital tuner with vacuum tube audio circuits ($600) and two Moscode preamps, at $600 and $1000. If they sound nearly as good as the amp, they will be real contenders for state-of-the-art.

SHOWSTOPPERS: dbx

dbx aroused a bit of controversy with their Soundfield Imaging speaker system. The idea is to widen the listening area sufficiently so that those sitting off-axis will still hear a decent stereo image.

When one moves away from the centerline of a speaker pair, the image shifts toward the nearer speaker because the sounds from it arrive at the ear earlier than those from the other speaker. If the speakers' radiation patterns could be designed so that the closer speaker drops in level as one moves off axis, this would tend to compensate for the difference in arrival times.

The concept is by no means new. The dispersion of dipole radiators is inefficient off-axis, and with careful arrangement can produce a widened listening window. There was an article in a 1980 *Journal of the Audio Engineering Society* in which the author attempted to calculate the ideal radiation pattern to maintain a stable image. But dbx is the first company to specifically design and market such a speaker.

They calculated the optimum radiation pattern to be an ellipse, with the speaker sitting at the "outer" focus. That is, the speakers project more signal toward each other than they do toward the listener. This produces the desired result of having the closer speaker lower in level than the farther one.

It works fairly well. Although the image still "squinches up" as one moves to the side, the deterioration is far less severe than with most conventional designs. In this respect the design is a legitimate breakthrough.

Problem is, who needs it? The serious listener is going to sit in the best position and pay attention, while the non-serious won't really care. If the system were the sonic match of other $2500 speakers, the improved imaging could be considered frosting on the cake. But so much money has been spent on the multiple drivers and complex crossover required, that the sound quality is roughly in the $1000 league. Not bad, but not state-of-the-art.

The Soundfield Imaging speaker makes the most sense when several people are listening attentively. This rarely occurs when listening to music, but it very well might happen when a family is watching projection TV.

THIS CAN'T POSSIBLY WORK

The most interesting piece of pseudo-scientific claptrap at the show was John Bedini's "Ionic Amplifier." A diminutive "black box," it is intended to be placed in parallel with a loudspeaker, or in series with a low-level signal cable. The box is supposed to remove any and all deleterious effects of the cable, allowing 24 gauge wire to be used with your IRSes, and the cheapest Hong Kong coax to connect your SP-10 to your D-250. It does this by supposedly drawing energy from the ether!

The IA supposedly overcomes cable losses and errors by injecting corrective energy of its own into the speaker. Assuming this to be true, the correction required will depend principally on two factors: the kinds of losses introduced by the cable, and the kinds of errors the amplifier makes driving that particular speaker. How, then, does the IA know what kind of correction signal to apply? There is no calibration for amp, speaker or cable; i.e., "one size fits all." Therefore the IA cannot *possibly* work as claimed.

Perhaps the key to understandng what's going on here is the statement in Bedini's literature that this device puts in very little and gets a lot out. Sound familiar? It's the same old scientific snake oil that crackpots have been peddling for the last 300 years: *perpetual motion*.

Mr. Bedini's lackey claimed that it is possible, using a unique motor-generator set developed by Mr. Bedini, to simultaneously recharge the battery running the motor-generator, *and* power lights, for an indefinite period! If you believe that, then you can also accept Bedini's other claims that "a very special wave" allows the device to exceed the speed of light, that it operates "in a phi vacuum," (whatever that is) and that it uses a "special transistor which draws energy through fluorescence."

I hereby bestow on John Bedini the first annual Rod Serling Memorial Award

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WHERE ARE THEY NOW? DEPARTMENT

I bumped into Dr. Oscar Heil, the scientist who invented the Heil Air Motion Transformer, a planar membrane driver of unusual and still-controversial design, and who also holds patents on field-effect transistors dating back over 50 years! He claims they actually worked. If this is so, he deserves credit for inventing the transistor. Although I would normally be disinclined to believe him, Dr. Heil tells the following self-deprecatory story which, in my eyes, strengthens his claim.

In the early '30s, one of Dr. Heil's fellow-scientists was doing research on quantum energy levels in gases. He devised a way to excite particular levels to produce light at specific frequencies. To wit, he invented the laser! When he showed it to Dr. Heil, the good doctor talked him out of developing it any further, because it "didn't have any practical use"! In fairness to Dr. Heil, it *was* probably so far ahead of other technology that there would have been little use for it.

I BWOKE IT, I BWOKE IT DEPARTMENT

In last year's installment of this popular feature, I pulled the knobs off a non-working prototype of an equalizer made by an obscure Korean firm. This year I managed to do it to an NAD cassette deck prototype—while Peter Tribeman, NAD's president, was watching! Don't expect any NAD products for review in the near future, Gordon.

DECLINE AND FALL OF THE ENGLISH LANGUAGE DEPARTMENT

Charlie Bechtold, Contributing Editor to CES Trade News Daily, came up with this gem:

"CDs require less special handling, because they are more rugged than LPs and their digital error code correcting techniques and system redundancies are kinder to minor negligencies such as dust and fingerprints."

WELL, AT LEAST CDs GET MONO RIGHT DEPARTMENT

Then Mr. Bechtold topped himself one paragraph later:

"CDs are virtually noise-free. Harmonic distortion and separation are immeasurable."

DEPARTMENT OF WRETCHED EXCESS

The world record for the most expensive speaker system is now held by the Reuben Guss Enterprises System 1. It includes two humongous main speakers (about 3" by 6" by 2", *and looks* even bigger), along with two smaller satellites for ambience simulation. There are a total of 102 drivers! The price is equally staggering: $50,000.

The sound? Perhaps a shade better than the dbx Soundfield Imaging speaker![1] No match for Acoustats, Frieds, or the Magnepan MG IIIs, which go for 1/20 the price. The Infinity IRS and the WAMMs are no-holds-barred state-of-the-art systems, and to some extent they justify their high price with superb sound. The System 1 strikes me as merely an exercise in size.

CES VIDEO

NAD showed the prototype of a new 20" monitor. Uisng a special demo tape of excerpts from "Return of the Jedi," it produced the finest color TV images I have ever seen. The set uses Toshiba's new FST (flat/square tube). (I've seen Toshiba's monitor with the FST, and it,

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1 I didn't hear the dbx speaker, but I'm hard put to think of a speaker I'd less rather live with than the Gusses. They were played at unbearably high volume levels, seemed to have relatively high distortion (maybe it was my ears going into overload), and imaged as poorly as anything I've heard recently. In fact, I think imaging that poor must require quite a bit of work—the instruments sounded *glued* to the front of the speakers. Even a random assortment of drivers and crossovers might yield *some* realistic rendition of image! I was insulted that such a bad speaker was offered at such an exorbitant price, though there seems to be little danger of their taking over the $30,000+ market.

too, is a knockout.) NAD will also produce a set with Toshiba's upcoming 26" FST, which could be *the* monitor to have.

While Kodak and Polaroid continue to promote 8mm camcorders, RCA and GE finally saw the light and announced that they would delay the introduction of their machines in the new format. With sales of half-inch VCRs still climbing, why rock the boat by confusing the public with a new (and probably unneeded) format? GE says there's an interface problem between the hardware and software, which could be a euphemistic way to say that the transport chews up the tape.

Sony announced a high-speed video tape duplication system, called Sprint, that runs at 130 times normal playing speed! The technique is easy to understand. First, a mirror-image master tape is made on a special recorder that runs backwards. The tape used has an extremely high coercivity (about 2000 oersteds). High-coercivity tapes are hard to erase, and this is the key to the system's operation.

The master tape is brought into direct contact with the copy tape, and high-frequency bias is applied. The bias is not strong enough to erase the master, but it *is* strong enough to thoroughly mix up the magnetic domains on the copy tape. As the tapes leave the bias field, the domains on the copy tape align with those on the master.

Although the equipment is not cheap ($150,000), it eliminates a bank of copy recorders and their attendant wear and alignment problems. Sony expects the Sprint system to give Beta duplicators a price advantage that will translate into reduced prices for recorded tapes, and hence an increase in Beta VCR sales. The real competitive advantage is in the duplication of Beta Hi-Fi tapes. VHS Hi-Fi tapes use depth-multiplexing, which cannot be copied using contact techniques. Beta Hi-Fi (at least the NTSC version) is recorded conventionally, and thus CAN be duplicated with Sprint. This means that Beta Hi-Fi tapes could enjoy a significant price advantage over VHS Hi-Fi.

For those who enjoy video games, the CES had two blockbuster surprises. First, Atari showed the 7800, a $150 dedicated game machine with graphics capabilities substantially better than any other game machine or personal computer. And it plays all 2600 cartridges without an adapter! A 7800 adapter will be available at a lower price for 5200 owners.

Even more startling was RDI's announcement of a full video disk game system, complete with keyboard, voice recognition and synthesis, and a Pioneer LD-700 laserdisc player. The system comes with one game, and several others are available from $80 to $100. Equally startling was the price: $2000 with the LD-700, $1400 without. Nonetheless, RDI anticipates sales of several thousand this year. And since RDI is the parent company of the firm that created "Dragon's Lair," I expect to see that game, "Space Ace," and future titles released for this machine. Oh, yes. The system is called "Halcyon." Get it?

Finally, the purveyors of mass-market hi-fi equipment can take heart from the following prediction. The approval of stereo sound for television (the Zenith system, with dbx noise reduction), along with Beta and VHS hi-fi recorders, will bring high quality stereo program material into the homes of hundreds of thousands of people who had never considered owning component stereo before. The industry therefore expects a substantial increase in the market for moderately priced rack and component systems. **BS**

PETER SNELL

Peter Snell, 38; President, Snell Acoustics died Thursday, September 20, 1984 from a heart attack. He was 38 years old and lived in Merrimac, Massachusetts.

Peter Snell, born in 1946 in Bar Harbor, Maine, graduated in 1969 from Marlboro College with a B.S. in physics. He did graduate work at Brown University before joining EPI in 1970 as a principal engineer. There he was responsible for production and new product development. He left EPI in 1974 to devote himself to the development of the Type A loudspeaker. In 1976, he began Snell Acoustics on Prince Street in Newburyport, Massachusetts. The company remained there and flourished until the move to larger factory space in Haverhill, Massachusetts in 1982. Snell had just completed the research, development and production procedures for the Snell A/Type III loudspeaker, reviewed elsewhere in this issue.

Mr. Snell is survived by his father, Dr. George Snell, who shared the Nobel prize for medicine in 1982, his mother Rhoda Snell, and his brothers, Roy and Tom. On Thursday, September 27, the board of directors voted to continue Snell Acoustic Incorporated under the leadership of Dr. William Osgood, who will serve as Chief Executive Officer. Dr. Osgood served as treasurer and senior vice president for the past two and one half years.

Peter Snell was a tall, thin man with classic features, blue eyes, and blond hair. When I first met him in 1978, he wore his hair long, neatly tied in a short pony tail. He liked vans, big dogs, and long listening sessions. He was soft spoken, but very enthusiastic and verbal about his love for natural sounding analog records and loudspeakers.

He visited my listening room on four occasions during the review of the Type A speaker. He always arrived with a van packed with audio gear—an extra set of Type A speakers, his ARC SP 6B preamp, Sony turntable, Haitian cotton sound panels, and a set of favorite records and CDs. Each time, the listening session took hours, and he ended up staying in the family's guest room. He got to know my children, who found him very easy to talk to. Even though he was devoted to audio, he enjoyed people and loved animals. He loved to "jazz up" my family's large, black Labrador, who would run circles round him in the listening room. He was a warm, easy person and a good friend. I shall miss him. **LG**

SNELL TYPE A/III LOUDSPEAKER SYSTEM

Four-way system with acoustic-suspension woofer enclosure, two stackable cabinets per side. Frequency response: ± ¾ dB, 38 Hz to 20 kHz; ±3 dB, 24 Hz to 26 kHz. Sensitivity: 86 dB. Crossover points: 275 Hz and 2700 Hz; rear-firing supertweeter operates from 10 kHz up in conjunction with front-baffle tweeter. Dimensions: 50¾" H by 23½" W by 14" D. Shipping weight: 295 lbs. Price: $3770/pr in walnut; $3890 in oak. MANUFACTURER: Snell Acoustics, Inc., 143 Essex Street, Haverhill, MA 01830.

Although audio is obsessed with new products, it's long-term market survival that determines the real classics, especially among speakers. Witness the staying power of such "ancient" speakers as the Quad ESL, the Klipschhorn, the Rodgers LS-3/5A, and the Dahlquist DQ-10.

So it is with Peter Snell's Type A loudspeaker. This hefty, multi-driver dynamic system has been updated twice since its 1976 debut and has continued to sell in spite of significant price increases. It has always been a high-output, low-distortion speaker that provided very even frequency response and a panoramic soundstage, though with some limitations in imaging and some difficulties in room compatability. And a number of non-sonic attributes have added to the Type A's attractiveness: it is a strikingly attractive piece of furniture; it can be placed against a wall,[1] making it easy to integrate into a living space; it can be run full range or biwired or biamplified; and Snell Acoustics has an exemplary customer service policy, evident in their quick warranty work.

The latest Type A—the A/III—is a taller, bigger version of the earlier models: 4 inches taller, 1 inch deeper, 65 pounds heavier, and equipped with a rearward-firing supertweeter. It is also more expensive, the new price being almost 50% higher than that of the model it replaces, the Type A/II.[2] In fact,

1 Actually, the manufacturer points out that it was never intended to be placed right against a wall, but rather a few inches out. In fact, against-the-wall placement was promoted by numbers of Snell dealers. **LA**

2 The Type A/II is actually still available on special order, at the increased price of $2950.

the changes in the A/III make it a totally different loudspeaker, rather than a third revision as its model designation would seem to imply.

Each channel of the system is composed of two easily movable, separately packaged enclosures. The 51-lb upper section houses the midrange and tweeters, and is located by pegs to the top of the 72-lb woofer base. The front is finished in lacquered wood veneer, and the back is covered with a black matte wrinkle.

Many of the Type III's design elements have evolved from earlier Type As. To minimize midrange-tweeter interactions and cabinet diffraction, the upper enclosure uses a biconvex curved baffle and acoustical padding to absorb sound waves before they reach the cabinet edges. Relatively low crossover frequencies of 275 and 2700 Hz are used, and the drivers are aligned vertically, the height of the midrange-tweeter array being set at seated-ear level.

Other than dimensional changes, the addition of a rearward-firing supertweeter (which can be switched in or out) is the most obvious change from earlier models. The sonic contribution of the new tweeter was not apparent until I turned it off, at which time I became aware of the ambience it had been imparting.

The lower, 2.9 cubic foot, cabinet houses a 12-inch downward-firing woofer. The woofer's close-to-the-floor placement evolved from Roy Allison's early studies, which showed that that bass-canceling wall and floor reflections will be minimized if the woofer is placed very close to these surfaces. The woofer enclosure is internally divided into small compartments, with bracing in all directions. The 3 dB-down point of the speaker is now 28 Hz, which is a big improvement over the 38 Hz delivered by the A/II. In addition, the sensitivity of the whole speaker system has been increased to 86 dB.

The midrange driver and forward-firing tweeter are mounted on a biconvex baffle. The midrange driver is isolated within its own cylindrical container, which in turn is supported in the baffle by foam mounting. The midrange-tweeter baffle is heavily damped, and is isolated from the woofer cabinet by absorbtive pads. The upper cabinets are provided with ¼-inch shims for tilting them back to equalize arrival times from the different drivers.

Earlier versions of the Type A were criticized for having mediocre imaging (wide, but not particularly deep soundstage) and a somewhat thin, hard sound in very reverberant listening rooms, like mine. The A/III generates the wide soundstage of the II, but now with adequate depth and far greater realism. Instruments and voices now have a 3-dimensionality to them. With an image height that's shoulder high, the sound "picture" reaches vertically and horizontally beyond the cabinet boundaries to the ceiling and side walls. It is the only speaker I have heard that creates the illusion of turning the rear wall into a large window for sound, but without inflating image size. The overall effect is of a grand, epic portrayal of the music: to do this and maintain realistic image size is impressive. I would go so far as to say that the A/III possesses much of the palpable realism heard on the Quad ESL-63.

At times this effect can be especially convincing. The nightclub atmosphere heard in the background of "Limehouse Blues" from the Proprius record *Jazz at the Pawnshop* comes through with all its subtle ambience clues, emanating from a wide area behind the instruments in the jazz ensemble.

The A/III's bass performance is close to being the best I have heard. Outside of the WAMM system and the new IRS Type III, I've never heard such low-frequency power from a speaker. Driven by a single Levinson ML-9, the loudspeaker rocked my living room—and literally flapped my pant legs—playing *The Rite of Spring* on the Telarc CD (80054). And it was a revelation to be shaken by the weight of the giant marimba's 25-Hz pulses on Harry Partch's "Delusion of a Fury." The thunderous organ notes on E.

Power Bigg's recording of the Saint Saens Organ Symphony (No. 3 in C Minor, Columbia MS 6469) were more clearly defined than from my RH Labs SB-1 subwoofer.

The upper bass and lower midrange come forth with power and realism, but not overemphasis. Whereas the Type A/II was thin in the midbass and not particularly good at rendering instrumental timbres, the new Type III is excellent in these areas.

To my ear, the Type II redefines the meaning of dynamic range. Not only does it play very loud (or soft) with coherence and detail; it tracks program dynamics faster and with greater ease than any dynamic loudspeaker I've heard. If you happen to own the remarkable CD from BIS, *The Kroumata Percussion Ensemble* (CD-232), try playing "Hierophonie V"—but be careful, the crashes of the tympani errupt out of total silence! The Type IIIs rendered this percussion disc with complete naturalness. Even driven by only a single Levinson ML-9, the system can track orchestral climaxes up to 104 dB at 10 feet !

Soft passages too are played with great inner detail, making the new Snell speaker superb for the dramatic nuances of chamber music. Shadings of dynamic change, as well as absolute loudness, are well portrayed.

This great dynamic range and powerful bass makes the Type A/IIIs a fabulous speaker for popular music. I's the best speaker I've found to really get *into* Steely Dan's *Aja* album (VIM 4039). Besides the strong, solid beat, the speakers put the listener directly in the atmosphere of the best two cuts: "Black Cow" and "Aja."

Piano music is rendered almost flawlessly: recordings of small pianos sound like a good imitation of the real piano that sits nearby in my living room.[3]

The speaker's even power radiation at high frequencies can expose an amplifier's top end mercilessly; in a highly reflective room the new Snells may even sound hard. Even so, little if any of the midrange shrillness heard with the Type IIs can be found in the IIIs.

This speaker does best with a very powerful solid-state amp, such as the Levinson ML-9 (330 watts per channel and 700 watts instantaneously into 4 ohms). While the A/III sounded very open and clean with less powerful amplifiers, such as the Tandberg 3006A or the VSP-150, none came close to producing the thunderous bass power of one ML-9.

Snell encourages either biwiring (parallel wires from one amplifier to the bass module and the woofer/tweeter module respectively) or biamplification. The upper and lower sections of the speakers are interconnected by a banana plug jumper cable which can be removed to allow these alternate hookups. Biamping does not require an electronic crossover: Each cabinet houses its own crossover. Since the crossovers are in parallel, the amplifier is able to deliver full current to each module. Most of the advantages of an electronic crossover are thus achieved with none of the disadvantages (cost, phase inaccuracy, distortion and veiling). The one remaining problem, which would be solved with an electronic crossover is the tendency for the passive crossover to diminish coupling between the amplifier and the woofer.[4]

I tried biamplifying with two Levinson ML-9s, a single one of which had at first seemed perfectly adequate. There was an immediate awareness of the sound opening up as ambience information increased, the soundstage became wider, and perceived sonic detail was

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3 Yes, I own a piano. While the "real thing" emphasizes the phoniness of just about every speaker I've had in the house, the Snell Type III loudspeakers do an excellent job of creating a passable imitation. Strangely, the piano shows far fewer "room-interfacing problems" than any speaker I've played in my listening room.

4 Since every power amplifier has some IM distortion, no matter how low, there is also an advantage in routing bass and treble through separate amplifiers; that is, using an electronic crossover. JGH

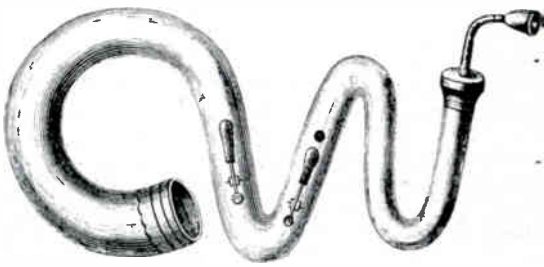
enhanced. A good example is the "Gates of Dafos" cut on on Reference Recording's *Dafos*: When biamplifying, I was put more in touch with the room where the recording was done. Wall reflections and ambience cues were clearer and more revealing. Bass response, already outstanding on the A/IIIs, was also helped. The large drum on the "Passage" cut from the same disc produces an amazingly percussive sound, percussive in the true sense of the word: a steep wavefront followed by a sledgehammer sensation of solidity and impact. Emerging above this, with no smearing of detail, were the distinctive sounds and imaging placement of the full truckload of Mickey Hart's gear—the bongos, snares, cowbells, blocks, gongs, and cymbals. Dynamics (again, already very good on the A/IIIs) also got better when biamping. There was both greater preservation of detail and a capacity for loudness increase that was almost frightening.

Alternatively, one can try biwiring, which is claimed to reduce the modulation of one driver by the back electromotive force from another. Biwiring yields significant improvements over monowiring, tightening the bass and sharpening the transients. I found biwiring to be essential for obtaining the greatest clarity from less powerful amplifiers, such as the 100 watt-per-channel Spectral DMA-100, or even the 200 watt-per-channel Sumo Andromeda. The favorable comments above about the Levinson ML-9 relate to using it in the biwired mode. Biwiring does not yield the same improvements as biamping, but it's much less expensive.

It should be obvious by now that I really like the Snell A/IIIs. In fact, they're the best speakers I've had in my house, maybe the best I've heard anywhere. But any time a critic is exposed to a component that sounds dramatically different and *better* than its predecessors, his critical faculties tend to be short-circuited. In other words, there may be problems with the A/IIIs which will show up after very extended listening. On the other hand, I've had them for two months now, and just like them more and more! You should also be warned that I favor bass-rich speakers (I used to leave my Dynaco loudness control *on* when I listened to my KLH 6s!),[5] and the Snell's powerful bass response tends to enhance the bass characteristics of all music---which means it's a speaker I would be almost certain sure to like. In further listening I found this bass-richness to be centered around 100 Hz, although the impression of profound low end is not a false one: it's really there. Other listeners may react differently to the A/IIIs' bass presentation than I did.

The one area in which I find the Snells to be somewhat deficient is soundstage depth. Although the imaging has been improved over the A/II, the Snells continue to produce a shallower field than the best available, and listeners for whom this is especially crucial should carefully audition the Snells before buying.

That one criticism notwithstanding, I feel the A/III is destined to be one of the two or three outstanding loudspeakers of the '80s, regardless of driver design or price. For many years, electrostatics and planar drivers (such as the Magnepans) have excelled as the most transparent, realistic loudspeakers. Now the Type III offers a large-signal, dynamic alternative for the audiophile interested in the best sound—and able to pay for it. **LG**



5 May the good Lord be merciful of your past transgressions. JGH

PENTAGRAM P-10 LOUDSPEAKER SYSTEM

Three-way dynamic loudspeaker system of pentagonal cross-section. Drivers: 2″ leaf tweeter, 3″ midrange, 10″ woofer, 15″ passive radiator. Frequency response: 24 Hz to 20 kHz, 2 dB. Crossover frequencies: 450 Hz, 5.5 kHz. Impedence: 7.2 ohms (nominal) Dimensions: 340 H by 22″ W by 22″ D. Weight: 90 lbs each. Price: $1800/pair. MANUFACTURER: Pentagram Loudspeaker Co., 207-19 35th Avenue, Bayside, NY 11361.

One of the oldest and—truest in my view—maxims of audio states that the loudspeaker does more to determine the overall characteristics of a good system than any other component. Choosing a speaker is somewhat akin to choosing underwear: whether one prefers boxers or briefs, cotton or synthetic, it's a question not of right or wrong but a matter of personal taste, and of what works best in one's particular circumstances.

The P-10 reflects a somewhat unconventional approach to building a conventional loudspeaker, the most innovative aspect being its tapered, pentagonal shape.[1] The nonparallel cabinet sides tend to reduce the colorations and resonances produced by standing waves. The tapered cabinet also allows the drivers to be time-aligned.

I found the walnut-veneered appearance of the P-10s to be quite attractive, though their relatively large size hardly makes them unobtrusive. The units are designed to be freestanding and each has five caster feet which make it easy to roll the unit into the corner or against the wall when not in use. While these casters certainly make for easier moving (the speakers weigh 90 lbs each!), I doubt they do much for the sound quality. I noticed some horizontal smear in the image for which the casters could be partially responsible.

The British have recently been doing a lot of work with speaker stands and have found that very firm grounding (mechanical, not electrical) of the speaker to the structure of your house can have a substantial effect on the sound. The reason is a familiar one: every action has an equal and opposite reaction. Every time the loudspeaker cone moves forward it has a tendency to push the loudspeaker cabinet backward. Since the cabinet is much heavier than the cone, and is connected at least somewhat to the house, this backward movement is minimal, but the loudspeaker will work better if the backward movement is very close to zero. The limited testing that I

1 The loudspeaker is geomentrically a truncated pentagonal pyramid; a pentagram is a 2-dimensional figure commonly known as a 5-pointed star, and is the logo for Pentagram Loudspeaker Co.

have done confirmed that devices like spikes on speaker stands (to go through your carpet to the floor) do make a difference, but I am not prepared to say how much.

With the Pentagram's casters you have three sources of disconnection between the speaker and the house: cabinet to caster, caster to carpet, and carpet to floor. Since the speakers were on loan from a dealer I didn't experiment with spikes inserted into the P-10s' bottom frame, but I think they might make a difference.

Speaker wires are connected via terminals on the bottom of each unit. This method makes for an external appearance unmarred dangling wires, but it's a royal pain when the plugs keep falling out. The driver lineup consists of a downward-firing 15-inch passive radiator, a 10-inch woofer, a 3-inch dome midrange (composed of a cellular material resembling a fly's compound eye), and a horn loaded leaf tweeter.

The leaf tweeter provides the strongest element of the P-10's sound quality: clean and detailed high frequency performance. Treble was conveyed well, with a natural sense of ambience; the highs had a satisfying sense of "air." As with any speaker having outstanding high frequency performance, the P-10s tend to show up flaws in the associated equipment. Moving coil cartridges with a bright or rising treble response, and electronics that are grainy or hard, are difficult to tolerate on the P-10s. Restricted high frequency extension on amps and preamps is also readily noticeable, though not so hard to tolerate.

Ironically, the P-10's fine high frequency performance is the source of a problem elsewhere. The treble is sufficiently superior in performance to the midrange as to make the crossover quite noticeable. Although there's no obvious frequency response aberration at crossover, the midrange driver[2] somewhat soft character contrasts all too apparently with the transparent and detailed leaf tweeter.

The soft midrange, combined with a mild accentuation of the lower midrange and upper bass, gives the P-10s a mellow warmth that was quite euphonically pleasant. This musical character was further complemented by the P-10's good power handling capabilities. The result was an open, effortless and somewhat relaxed sound that I found very easy to live with. They rarely sounded constricted or strained, even at very low or high volume levels. But, as is generally the case with euphonic "musicality," there's a penalty. The speakers have a tendency to round off sharp edges, masking fine detail. Massed strings and male and alto choral voices, for example, sounded somewhat slurred together.

Midbass and low bass performance are good, considering the P-10's size and price, but only if used with a first-rate amplifier. Bass extension is more than adequate, though the P-10s are not capable of producing prodigious SPLs in the bottom octave. If the amp does not have much better than average bass control, the speaker sounds loose at the low end.

The P-10 has a tendency toward boominess in the midbass, which could only be slightly alleviated by placement. The horizontal smear referred to above (possibly attributable to the casters) and loose and boomy bass are problems I have noted on other passive radiator designs.

I first used the P-10s with a modestly priced solid-state amplifier, and the result was a disaster. The leaf tweeters mercilessly exposed the amp's high frequency problems, and the amplifier lacked the ability to exercise any reasonable control over the P-10's midbass. The resultant boominess was intolerable. Even the highly touted Robertson 4010, for all its

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[2] I think that Pentagram should seriously consider using damping in their cabinets, although it would probably interfere with the operation of the passive radiator (though maybe not too much at the frequencies at which it works). There's no getting around the fact that energy that goes into the cabinet from the active driver must either come out as sound (via the cabinet or passive radiator) or be dissipated as heat. **LA**

purported "Moxie" power and damping ability, was unable to keep the situation under control (although it reduced the boom to more moderate levels).

Switching to the BEL 2002 (one of those $2400 class A-super amps) managed to eliminate all but vestigial traces of boom and helped to tighten up the low bass, making the P-10's overall bass performance rather good (but still short of excellent). The BEL also allowed the benefits of the P-10's excellent high frequency performance to be realized, though nothing really seemed to alleviate the midrange softness. Most of the solid-state super amps, such as the Krell, Eagle 7A, or Thresholds probably would make suitable partners for the P-10s.

I suspect, however, that not many purchasers of an $1800 speaker system will welcome the need to spend several thousand dollars more for an amplifier to make their speakers sound better than just tolerable at the low end. The Acoustat TNT-200, the Electrocompaniet, and the new BEL 1001 may also work well, though I haven't listened to the speaker with them. I strongly urge potential purchasers to audition the P-10s with the amp they intend to use, *prior* to purchase.

The P-10s were relatively immune to both to soundstage changes and frequency response anomalies due to placement; except for the need to position them away from walls, good sound could be obtained with the P-10s located almost anywhere in the room. This flexibility in positioning should prove an advantage to purchasers whose listening rooms cannot be dedicated exclusively to hi-fi.

Soundstage and imaging are good on the P-10s (almost regardless of the amplifier I used), but they are not the best example of what can be done in these areas. Soundstage width is fine, but depth presentation is limited and unconvincing. Image size is smaller than life and, as mentioned above, there is some horizontal smear. On the other hand, the listening window is large and, at a reasonable distance, good stereo effect can be obtained from any listening position across the length of a fair-sized couch.

Summing up, the P-10s are capable of good performance but lack that special something that makes them stand out from the crowd. This, coupled with the need to use them with an excellent and expensive amplifier, disqualifies them from receiving my strong recommendation. Still, they have sufficient virtues that if one is looking for speakers in the under-$2000 price range, and has or is willing to spend the money to buy a first-rate amplifier, the P-10s should be auditioned. Undoubtedly there will be some systems and rooms for which they will be the right choice. Also, their tendency towards euphonic mellowness, and their attractive appearance, might make them an excellent choice for less critical buyers. I suspect the P-10s will please a lot of listeners who are music lovers, but perhaps not audiophiles.[3] **SWW**

Publisher's Note: I've had the good fortune to live with the P-10s for over a year, and have experienced three different modifications (one of which I installed myself, with great difficulty). The current model has, according to the manufacturer, remained unchanged for some time now, which is a blessing.

I really find nothing to disagree with in SWW's review, but I believe a few points need emphasis. In the general opinion of visitors to my home, the P-10s really are very attractive-looking, and they are easy to move around if you have a party or need unimpeded floor space. The quality of finish is very high. And if you test a lot of small speakers, the P-10s serve nicely as speaker stands.

They *are* quite uncritical of location, furnishing an adequate stereo image in many room positions. I can't agree with SWW's observation that the soundstage is relatively amplifier-insensitive,

[3] I'm not sure about this. Many audiophiles are more tolerant of this kind of laid-back sound than music-lovers—or me for that matter. From SWW's description, I have a feeling I would have been less favorably disposed towards this speaker. **JGH**

however. Two amplifiers did outstandingly well with the Pentagrams: the EAR 509 and the Quicksilver, both tube units. The EAR is an especially good match, because its superior low-end control (still unmatched among tube amps in our experience) helped the low-end looseness of the P-10s. I felt the imaging and soundstage characteristics were nothing short of phenomenal, especially in terms of 3-dimensional palpability. Those singers were right there in the room!

The Quicksilver supplied much the same imaging characteristic, but let the low end get a bit out of control, so the overall result was not satisfactory in the long run. If you own P-10s and aren't delighted, try tne EAR; similarly if you're considering the P-10s. **LA**

B & W 801 F "SPECIAL" SPEAKER SYSTEM

Three-way dynamic speaker system. Drivers: 26 mm stiff-dome tweeter, 100 mm aromatic polyamide fiber midrange cone, and 270 mm PVA-impregnated long throw Bextrene woofer. Acoustic suspension enclosure. Closed box resonance: 37 Hz. System Q: 0.7. Power rating: minimum 50 watts into 8 ohms, no upper limit. Impedance: 8 ohms nominal. Sensitivity: 85 dB. Crossover: Fourth order. Dimensions: 37½ " H by 17" W by 22" D. Weight: 108 pounds each speaker. Price: $3500/pr (Walnut/Teak/Black Ash); $3950 (Rosewood). IMPORTER: Anglo American Audio, P.O. Box 653, Buffalo, New York, 14240. Also Ango American Audio, 1200 Markham Road, No. 506, Scarborough, Ont., N1H 3C3, Canada.

Recent issues of *Stereophile* have praised certain loudspeakers, including the Spica, that were computer-aided designs (CAD). Much of the pioneering work in CAD was done in Britain by KEF and B&W in the late 1970's.[1] Reserved for their top-of-the-line products, CAD techniques permitted highly precise manufacturing methods for the expensive KEF 105.2 and the B&W 801, with speaker pairs being frequency calibrated to within 0.5 dB. The more expensive 801 was adopted as a monitor by a number of recording studios, in particular EMI's Abbey Road location, and in fact has come to be regarded as a British classic.

In spite of its historical and technical importance, the earlier 801 has met with a mixed reception among American audiophiles: it was expensive and heavy (though very reliable), its pod-like midrange/tweeter housing made the 801 look more like a robot rather than a loudspeaker, and it was very low in efficiency, requiring powerhouse amps like the Levinson ML-3.

I recall that the early 801s imaged wonderfully, but suffered from resonances in the lower midrange that made them sound excessively warm and loose. In spite of these problems, the 801 has been quite a commercial success on this side of the Atlantic, probably because of its "pleasant" and easy-to-listen-to sound.

B&W has continued to upgrade the 801 since its 1979 introduction, finally introducing in its "F" version an exotic fibrecrete (glass reinforced concrete) inner lining to the polystyrene midrange cabinet, complete with improved (by laser interferometry analysis) tweeter and midrange drivers. Other design

1 The CAD of Spica however, is significantly different from the initial work done by KEF and B&W. Spica uses programs designed by Dean Jensen allowing sophisticated analysis of phase accuracy (among other things), which was not a consideration with the earlier British products.LA

elements show that John Bowers and the B&W engineers have done their homework: time-aligned drivers, low-diffraction cabinet construction (rounded corners, padding under the midrange-tweeter "head"). The unit reviewed here is the "801F Special", the latter designating the new TXS 26 tweeter, whose motor/diaphram assembly was fine-tuned with computer-linked laser interferometry. Would this latest version, with its new exotic cabinet material and improved tweeter sound better than the pleasant 801 described above?

Unpacking and assembling these moderate-sized but very hefty speakers gave me an immediate respect for their solidity, internal bracing, and just plain weight. Inside the thick cartons, the system parts are cushioned in an imposing polystyrene pack. Sophisticated as the B&W is, the final assembly involves securing the head assembly to the bass module with a huge screw turned by a British coin—and a penny at that! Casters permit the 801s to be moved easily. The head assemblies can be rotated on the bass module, so that the midrange-tweeter units can be aimed directly at the preferred listening seat. I set up the 801s 10 feet from the back wall and 6 feet from the side walls, a position favored by most loudspeakers for the least coloration in my 5000 cubic foot livingroom.

First sonic impressions of this new 801 focused on the system's inefficiency. All my 100-watt amps clipped before the 801's protection-circuit LED lit up. Only the Mark Levinson ML-9, with its peak output of 419 watts per channel, drove the 801s into a shut-off protect mode, after which they recovered with no signs of distress to either speaker or amp (no crowbar short here, as with the Quad 63s). This low efficiency also produced a subjective sense of compression, so that the loudspeaker did not show the dramatic variations between loud and soft musical passages heard with, for example, the new Snell Type A/III. In addition, the 801s have a slightly forward quality, with what I felt at first to be excessive midrange presence. At times, male voices develop a pinched, nasal tonality. Setting the "environmental" midrange controls to the "B" setting (1.5 dB cut from 1 to 3 kHz), as preferred by the EMI studios, lessened this effect.

The 801s generate a small sonic stage, low to the floor, which may explain why EMI uses them perched up about 4 feet above the floor. Physically taller systems, like the Magnepan MG-III and the Snell Type A/3 do better at filling the room with a life-size, listener-height, image. In addition, the 801's woofer could not reproduce the lowest bass octave, producing a soft, poorly formed rendition of the bass drum on the new Telarc Compact Disk recordings or Harry Partch's giant 25 Hz marimba on CBS's analog record of his music.

But first impressions tend to be misleading, particularly with loudspeakers, and so it was with the 801s. As time went by I began to realize that I was hearing a great deal of new musical information. Imaging showed a holographic three-dimensionality, not surprising for a system that generates a small, highly focused sound field. In comparison with the Dahlquist DQ-10s and other highly regarded dynamic systems, bass lines were clearer, midrange and bass percussion transients were faster and cleaner, and lateral imaging was highly stable. In spite of the aforementioned forwardness and nasality, the 801 did an excellent job of producing natural, sweet, unfatiguing vocals, which came through with an uncanny reality to them. There was a transparency and lack of distortion that was increasingly appreciated the more I listened. My family members, who normally dismiss my audio system as the male parent's aberration, stopped, listened, and commented on the music's quality, rather than how loud the system was or how grating the singer's voice.

When I initially compared the 801s to the similarly priced Snell A/IIIs, I had to favor the Snells. The low end on the latter system is obviously better, and overall the A/IIIs are the more impressive speaker. Impressive isn't everything,

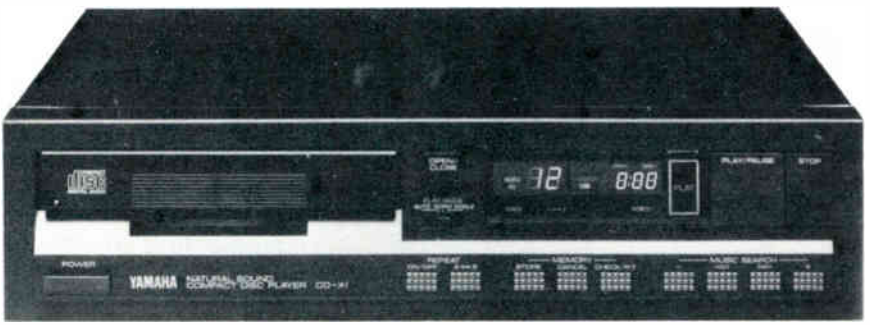
however, especially over the long haul (though I still like the Snells very much). All in all, I respect the 801s for their low distortion, quick transients, excellent lateral imaging, and extraordinarily natural voice reproduction—which is perhaps the best I've heard from a speaker. I feel that other dynamic systems which match the focus and transient speed of the 801s, such as the Spica TC-50s and the speakers from Thiel, have yet to equal its transparency.

There *are* problems: Although the B&W design group has smoothed out the excess resonance in the lower midrange, the very expensive 801F still requires a very powerful amp, generates a sound field with low image height, narrow soundstage, and the signal definitely sounds compressed at high power levels.

Perhaps feeling that further refinements to the 801 would not yield great changes, B&W has introduced a new top-of-the-line system, the B&W 808. This massive system shares some of the 801's superb drivers, but boasts 120 dB of output with low distortion, has a taller cabinet (which should provide more life-like imaging), and carries a commensurately increased price tag of $7000/pair. A brief audition at the June CES confirmed that B&W was well on their way to solving the problems of the 801.

As far as the 801 is concerned, I would recommend an audition to any potential purchaser, preferably in your own home with a superior, high-power amplifier. You may well find that the 801's remarkable reproduction of voice and overall naturalness outweigh its shortcomings; I did. **LG**

YAMAHA CD-X1 CD PLAYER



Minimally programmable Compact Disc player. Dimensions: 13⅜" W by 3⅝" H by 11⅛" D. Price: $599. MANUFACTURER: Yamaha, 6600 Orangethrope Ave., Buena Park, CA 90260.

CD player prices continue to go down and, surprisingly, sound quality goes up; the CD-X1 is an example of both. It's a front-drawer loader with some interesting innovations. Pushing the Open/Close button opens the drawer; it can be closed either by pushing the same button again or by pressing lightly against the end of the open drawer. (We understand this was done because many such players have been damaged by users trying to force the drawer shut by hand.)

The unit has three operating modes: Auto, Manual and Single. In Auto, play

begins as soon as the drawer is closed, or as soon as the AC is turned on if a disc is already loaded. In Manual, play begins only when you press the Play button. Single is the same as Manual except that the unit goes into Pause after playing a single selection. Pressing Pause then plays the next selection.

Track selection is by band number only; there is no indexing facility. (Personally, I think indexing is the least important programming feature of CD for a home user.) You can program the unit to play only specified bands on a disc—up to 23 of them—but only in the disc sequence. That is, you can't program it so that band 5 follows band 3. You can also play any of the bands which were not selected, without canceling the programming. You can program the unit to repeat, until canceled, a single band or any segment between any two points on the disc. Program memory is canceled by pressing the Cancel button, opening the drawer, or turning off the AC.

When a disc is loaded, the LED display shows the track number and elapsed time through the band it is playing. Pressing a button marked Check/Rt shows time remaining on the disc. This button also shows you what bands you have programmed for play, in case you've forgotten; any one band can be canceled without canceling the others.

Pressing the Search + or - buttons takes you forward and back by bands, or you can fast-speed in either direction at any of three shuttle speeds. Sound is heard at reduced level so you can tell where you are. For fastest shuttling, the arrow buttons are operated with the unit in Pause; no sound is audible but the timer shows your location on the disc.

The CD-X1 is one of the fastest operating players I've used. It took a mere 4 seconds to get from the start of a disc to the first note of band 10! Even the drawer action is surprisingly fast. The tracking system also seemed superb. The unit was immune to all but violent jarring, from any direction, and I never once heard a glitch from a disc, including one that has caused problems with other players. All control functions worked flawlessly and offered no surprises.

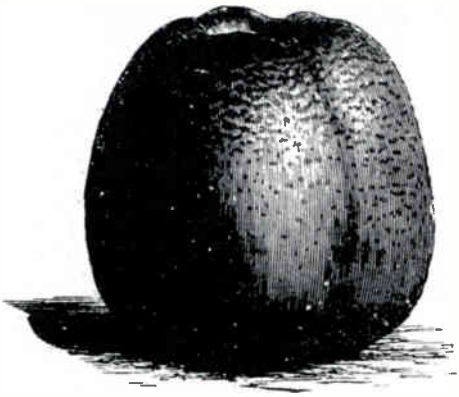
And the sound? Well, by a small margin, this is the best-sounding CD player I've used to date—just a hair better than the Philips/Magnavox 800. I am hard put to describe the sound of the CD-X1 except in terms of what is absent. There seems to be nothing between me and the original sound; soundstage width and depth are amazing (if the recording has it); there is virtually no high-end edge from good recordings; and the colorations I hear vary from recording to recording, indicating them as the source rather than the player.

I don't know how much better CD players are going to get, but the fact that differences between the best ones are becoming miniscule would seem to suggest that they are approaching an irreducible minimum of distortion. Obviously, the recordings are now the major obstacle to superb sound from CD.

If you don't need remote control, this is unquestionably the CD player to buy; if you do need remote control, check out the Yamaha CD-2, which we're in the process of testing. The CD-X1 is Class-A Recommended, without qualification! **JGH**

Publisher's Note:*To make up for our tardiness in publishing the foregoing review (it made it into Recommended Components way back in Volume 7, No. 2), we offer the following account of a luncheon with the CD-X1's designer, Mr. Toyasaki Matsumoto, which our NYC correspondent, Laurence Greenhill, was fortunate to attend.* ➡

MY DINNER WITH TOYASAKI



Toyasaki Matsumoto, designer of the Yamaha CD-X1 and manager of Yamaha's Design Group 2, recently visited the U.S. and met us for lunch at Nelson's, the famous upper West Side New York Delicatessen. After sampling the local pastrami, which he greatly enjoyed, we got down to business: the CD revolution and his company's new cost-effective player. Here are Mr. Matsumoto's views on the subject.

The key to the CD-X1's considerable success in the United States lay is its small size and reduced cost. Designed originally for the minicomponent market, the second generation CD-X1 achieved its cost effectiveness through the use of high density, Very Large Scale Integrated (VLSI) circuitry. Many first generation CD players were hand made, and their cost reflected that inefficient form of production. Yamaha currently has invested 6 million dollars in VLSI chip development, in the belief that the rapidly growing world CD market will go to the company that puts out the least expensive and most reliable CD players. The latest to be released from Yamaha will probably offer more features and even better value. In fact, the CD-2 offers the same sonics as the CD-X1,[1] but with cordless remote control for only $100 more.

With the recent closeout of the Technics SL-7 at $299, the "street price" of a CD player has been set quite low. Interestingly, the cost of Japanese CD players is lower in the US than in Japan, often by as much as $150 for the same unit.

Compact Discs also have begun to drop in price, as signaled by CBS-Sony selling CDs at $10 wholesale. Their Terre Haute, IN, manufacturing plant is due to come on line in 1985 as the first U.S. source of the shiny discs (current plants include Denon, Sony, Technics, and Sanyo sites in Japan as well as the Philips plant in Hanover, W. Germany). With 3000 titles now available in Japan, and many classical and operatic releases now coming out in CD format simultaneously with the cassette and vinyl editions, CD availability will increase and the price should continue to drop.

Matsumoto has designed an audiophile version of the CD-X1, the CD-1a, which will be marketed exclusively in Japan. The 1a uses premium parts at all circuit levels, discrete components rather than VLSI chips, independent power supplies with special line filters, a dual error correction circuit, independent left and right D/A converters, and an 11th-order filter employing polyproprylene caps. In short, everything a CD player *could* have to make it sound better—except perhaps tubes! The laser pickup utilizes a phase-detection, gain-switching focus servo with an auto-lock for its single beam, a totally different approach from the triple-beam of the CD-X1 and CD-2.

The CD-1a also allows the user to insert a 5-second interval before the beginning of playback and between each selection for cassette recording, as does the CD-2. In addition, a complex time display, skip operation, fader controls, monitor search, and progammable playback are all included. The unit is roughly twice the size of the CD-X1, weighs 25 pounds, 6 ounces, and would cost just under $2000 if it were sold in the United States. Wouldn't I give my eye teeth to take a listen to it! **LG**

1 Actually the sonics of the CD-2 are definitely better, though not by a wide margin. JGH

TWEEK:
A FIX FOR AUDIO JUNKIES

Contact enhancer in 0.5 cc. syringe. Price: $15. MANUFACTURER: Sumiko Inc., P.O. Box 5046. Berkeley CA 94705.

Most audio accessories give me a pain in the ass. They are all claims, short-term puffery, and long-term trouble. For example, how many salvations have you seen come and go by way of record preservatives? I am particularly leery of anything to improve electrical contact. I used Cramolin when it came in large cheap bottles, and I now use a variety of computer contact cleaners that come in large cheap spray cans. I don't use such cleaners often; it hasn't been necessary.

Now we come to Tweek—even if it didn't work it would have grabbed my attention. It comes in a hypodermic-like container and the name is a slight play on words. I know on good authority that it would have been called "Tweak" had its inventor not been so technical he couldn't spell. Having met a lot of odd tweaks in my time, how could I object to the idea of producing a product with this name and container, and charging an arm and a leg for it, even if it turned out to be salad oil. Who really cares what happens to junkies?

Evidently, the manufacturer of Tweek. The stuff works quite well on tube prongs, loose RCA plugs, those godawful Limo connectors, cartridge pins, and headshell prongs. I *know*; I've had to use it to make do with mismatched connectors where cleaning was not the problem, but erratic mechanical contact was a real bitch.

As for the technical side, Tweek "is a non-conductive fluid that increases conductivity on a molecular level when applied as a thin coating. By filling in the microscopic gaps in a metal-to-metal contact." I don't know if this is a complete explanation, I only know that part of it is not a complete sentence.

Don't let either the grammar or the technical aspect bother you. What counts is your mental audit trail for loose connectors anywhere in your system: Banana Plug X, Tube Y, RCA plug Z. Tweek will give you about a year of happiness for a hell of a lot less than the cost of fancy and pricey connectors.

A warning, however, about its use. Tweek is not really a contact cleaner. It will only clean a clear signal path if you coat the connector with it and twist or otherwise mechanically tweek (whoops!) it to ensure a good connection at the mechanical contact point. If you really need a cleaner, rather than a good audio connection, try Cramolin or a spray computer contact cleaner; use one that specifies no residuals left behind—and don't be too astonished if there *is* some residual over the long term. TV tuner cleaner, if you can find any in this age of electronic tuners, are suspect.

You should use as little Tweek as possible. Like Stylast, less is more. Similarly, I'd advise against cleaning contacts before using Tweek. If you get a really good contact with the Tweek, why risk any side effects from an additional contact cleaner?

Be careful in using Tweek with a high voltage circuit. Use it only on tube pins and wipe them before inserting the tube into a tube socket. There shouldn't be any risk, but tube sockets and bases are funny, and careless use may be just enough to put you into the arc-light business. For other contacts, spread a little around carefully and use its limited cleaning action; don't just pour and push.

Nice product. Surprising, though, from those dead serious IBM-clones at Sumiko. You don't expect humor from a firm where everyone is a tall thin blond WASP in a three-button suit. **AHC**

TECHNICS EPA-100Mk2 TONEARM AND 100C Mk4 CARTRIDGE

Tonearm: Medium-mass pivoted arm with "universal" plug-in headshell. Base/stylus distance: 10.8″ Overhang: 0.6″. Offset angle: 21°. Friction: 5 mg. Effective mass: 15.5 g. Price: $500. Cartridge: Moving magnet type. Frequency range: 5Hz to 120kHz (see report). Cantilever: tapered boron. Output: 1.2 mV. Separation: more than 25 dB at 1 kHz, more than 20 dB at 10 kHz. Channel balance: within 0.5 dB. Compliance: 12. DC resistance: 30 ohms. Inductance: 33 mH. Impedance: 210 ohms. Recommended load resistance: 10k to 1M ohms. Recommended load capacitance: less than 500 pF. Stylus tip: linear elliptical. Effective moving mass: 0.55 mg. Tracking force: 1.0 to 1.5 g. Weight: 18.3 g. Price: See report. MANUFACTURER: Technics, One Panasonic Way, Secaucus, NJ 07095.

While publisher LA was visiting the Technics factory in Osaka, Japan recently, he was handed two boxes with the request that he try out the contents and see what he thought of them. The boxes contained a tonearm and cartridge, both of which Technics felt to be their very best, and neither of which is available in the U.S. as of this writing.

We do not usually test "unavailable" components, as we feel it is a waste of time to consider at length something which must be ordered from overseas and for which there are (presumably) no service facilities in the U.S. I will admit that I dragged my feet about auditioning this cartridge and tonearm—not only were they unavailable here, but both looked as though they would cost the buyer an arm and a leg, even if purchased directly from some hi-fi store in Japan.

My reluctance was further fueled by the fact that the tonearm requires a 2½-inch cutout hole in the motor board, which would then preclude installing any other arm on that board,[1] and I didn't have a large enough hole drill. Finally, my curiosity overcame my innate stubbornness. We found a local machine shop to cut the hole, and I set up the arm with its cartridge.

First of all, let me say that the EPA-100 arm is one of the most impressive-looking I have ever seen. Finished in dull black, with laboratory-clean white markings for calibrations, the arm looks more like a precision instrument than a consumer product. But some of the remarkable features of this arm don't show at all. The arm tube is made mainly of titanium, a metal that combines great rigidity with very light weight. This is reinforced by a thin layer of boron, which is deposited on the inner surface of the tube to add additional rigidity and, through its differing density, to further inhibit mechanical resonance of the tube.

A large knurled ring surrounding the arm base allows for vertical-tracking-angle adjustment while a disc is playing (if the TT assembly is stable enough to permit this), and calibrations around the periphery of the base skirt allow one to return easily to any previously noted base-height setting.

The EPA-100 has an unusual dynamic damping system for controlling the arm/cartridge resonance. What looks like the counterweight at the rear of the arm is actually a hollow chamber. The main counterweight, which is inside this, is attached to one end of a rod that is spring-loaded against the rest of the arm. The spring allows the counterweight to wobble from side to side like a pendulum. The mass/compliance ratio of the coun-

1 This wasn't quite true with the VPI turntable, whose tonearm board can be switched back to front, allowing tonearm holes per board.

terweight assembly is set so that the wobbling occurs at around 5 Hz, which is close to the system resonance with a very compliant cartridge mounted in the arm.

Most tonearms, at system resonance, will oscillate from side to side or up and down. With the EPA-100's dynamic damping, however, each time the arm swings in one direction the counterweight's inertia causes it to lag behind the arm's motion, bending the spring that fastens the counterweight to the arm. The bending causes the spring to apply force to the arm in reverse direction to the arm's motion. When the arm and counterweight are both oscillating, the inertial forces of the arm and counterweight are exactly 180° out of phase, and the effect is to cancel the spurious motions of both.

Without damping, a vibrating system's resonance is exceedingly sharp and narrow. Thus, when two resonances are used together for cancellation, they must resonate at exactly the same frequency in order for those resonances to cancel one another. And if one is more damped than the other, the shape of their resonance curves will be different and cancellation will be incomplete. If the cartridge's stylus suspension and the counterweight suspension are both undamped, and the arm and counterweight resonate (oscillate) at exactly the same frequency, cancellation will be virtually complete. In the real world, though, stylus suspensions always have a certain amount of damping, and compliances vary widely from one cartridge to another. Under these circumstances an effective dynamic damping system will need to be both non-critical (broadly resonant) and adjustable in order to meet the varying requirements of a "universal" tonearm.

Technics approaches this in two ways. First, liquid silicone damping in a sealed cylinder is applied to the counterweight assembly. This has the effect of diminishing and broadening its resonance characteristic.

Second, an ingenious means is provided for adjusting the resonant frequency of that assembly. At the back of the EPA-100 is a threaded adjusting ring with a disc-shaped magnet at its center. Rotating this ring changes the distance between, and hence the attraction between, the magnet and the rear of the counterweight. The greater the attraction, the more the magnet tends to immobilize the counterweight, inhibiting its flopping motion. This has the same effect as reducing the compliance of the counterweight suspension spring: it raises the frequency of the resonance. Varying the magnet/counterweight distance thus allows precise matching of the counterweight resonance to the frequency of the arm/cartridge resonance. Ve-rrry clever!

Also unusual is the use of *ruby* ball bearings in the gimbal pivots. Technics claims that a ruby has a coefficient of friction ⅓ that of iron (or steel?), and specifies the EPA-100's friction at an unprecedented 5 mg. I could not verify this except by observing that, when balanced out to zero tracking force, the arm floats as freely as only one other arm I've ever encountered: the Eminent Technology air-bearing unit. In short, the EPA-100 appears to have the lowest friction of any pivoted arm I've tested!

The headshell supplied weighs 10 grams, and is perhaps the only real weakness of the EPA-100. It is quite resonant, producing a marked ringing sound when tapped. The audibility of this ringing is diminished when a cartridge is fastened tightly to it, but the resonance remains, and imparts a slightly bright, glary quality to the sound when reproducing discs. Less resonant headshells are available and are recommended when using cartridges other than the 100C. But then, this report is about the EPA-100 and the 100C.

The 100C cartridge is a formidable device that is best described as clunky-looking. It does not mount via the usual ½-inch-spaced holes but terminates instead in a "universal" plug, which attaches to the standard receptacle of most arms that accept a plug-in headshell. (Figure 1.) It has a heavy, pivoted plastic stylus guard that swings down and locks

in place. A small screw right behind the cartridge can be loosened to provide fine adjustment of both tangency (along a calibrated scale) and verticality (torsional alignment). With the EPA-100 arm mounted as recommended (in the unusually lucid instructions), proper tangency is obtained when the adjustment is lined up precisely with a small red mark on the scale. The stylus is user-replaceable, and is held firmly in place with a small screw to prevent the removable block from vibrating independently of the cartridge body.

The cartridge weighs 18 grams, which, added to the 6-gram effective mass of the arm, totals 24 grams. Rated frequency response of the 100C is ±3 dB from 15 Hz to 80 kHz or ±0.3 from 20 Hz to 18 kHz. These are the kinds of numbers normally associated with those low-compliance moving-coil cartridges that require 2 to 3 grams of tracking force just to stay in the groove. Yet the 100C has a rated compliance of 12 and a recommended median tracking force of a mere 1.2 grams! System resonance in the EPA arm was 9 Hz, which is close to ideal.

With the arm's damping adjustment tweaked for minimum resonance amplitude, the LF response hump measured a piddling 4 dB and was quite broad. As a result there was very little woofer pumping at subsonic frequencies, which afflicts so many high-mass moderate-compliance pickup systems. In fact, this system yielded the smoothest, widest-band frequency-response measurement I have ever obtained from a pickup. (I could not verify Technics' claim of response out to 120 kHz but can vouch for its response out to 50 kHz which is the smoothest and most extended I have measured from any cartridge. Not only that, it *sounds* that extended.)

This is, quite simply, one of the two best-sounding pickups I have ever had the pleasure of living with, the other being the $3200 Robertson EK-1—which I haven't heard for about a year. It is comparable in smoothness and transparency to the Robertson, but goes deeper and has greater solidity and impact at the low end, as well as going farther out at the extreme high end. This is, in fact, exactly the sound I had hoped someday to hear from a moving-coil cartridge. The clarity, neutrality, detail and focus are so good that I have no desire for any further improvement of those qualities. (Okay, so it's heresy, but that's the way I feel.)

Imaging stability and soundstage presentation are superb, and the whole sound is so effortlessly clean and open that my entire record collection has taken on an order of magnitude enhanced listenability. Even old mono LPs sound reborn. There are probably (inevitably) some mild colorations to the sound, but after many weeks of listening (totaling perhaps 150 hours), I find far more coloration from the discs themselves than I have been able to detect from this cartridge. And it doesn't need a step-up device. Although it has about ⅕ the output of the average moving-magnet cartridge, its very low impedance tends to reduce preamplifier noise by almost the same factor of 5, assuming that the noise originates where it usually does, at the preamp input. This ability to do without an expensive pre-preamp or transformer has to be figured into the cost of this pickup, about which more later.

Amazingly, the thing tracks as well as the Shure V-15! Even the infamous Telarc *1812* gave it no audible trouble at all. It just sailed through those cannon blasts as though they were mezzo-forte cello passages! In fact, I have yet to hear this pickup mistrack on an unworn disc. If it has done so on occasion, it did it so suavely that it never called attention to itself. Even on severely worn discs, mistracking sounds more like a fuzziness than a rattle.

Since I have favored the Shure V-15 cartridges for lo these many years because of their extraordinary midrange neutrality and sweet, integrated high end, comparisons and a clarification are in order here. To begin with, the Technics sounds almost exactly like the Shure through the middle range, at least

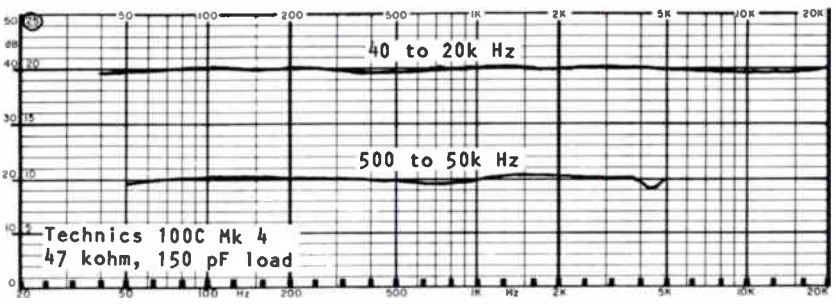
in the accuracy of musical timbre reproduction. It also tracks as well as the Shure. In other respects it is better. It goes deeper with greater impact, it has far better transient response with none of the Shure's subtly closed-in quality, and it has rather better inner detailing and soundstage presentation. But what about that "sweet" high end that I always valued in the Shure? Here I must do a bit of a *volte-face.*

In view of what I have found during the past year, I must conclude that I have, to some extent, been balancing off a slightly "hot" loudspeaker high end (from Acoustats, for example) against a correspondingly soft cartridge high end. The result was beautifully musical, but neither was quite accurate in itself. Having now listened to a lot of digital recordings, as well as to some direct-wire feeds from microphones known to be fairly flat at the high end, my standards for high-end balance have changed a little. I now find speakers which I had previously felt to be soft at the top (such as the Watkins WE-1s) to be pretty close to right. These now tend to make the Shure cartridges sound a little *too* "sweet." According to my revised standards, the high end of the Technics cartridge is right on target, at least when paired with the Berning TF-10 or the C-J PV-5 preamp. Using either preamp in conjunction with this pickup, one can go from CD to analog discs and hear minimal differences at the high end.

So, what's the catch with this arm/cartridge combination? It can't be perfect; nothing is. Frankly, I have yet to hear something I don't like about it. It probably isn't the world's first perfect arm/cartridge combination, and I am confident there are others that will outperform it in some ways. I do not know of any that are so good in *every* way.

If there is a catch here, it is probably the price and the availability. The arm sells for around $500 in Japan, the cartridge for around $300. If Technics were to bring these into the U.S., they would have to sell together (which is the only way I would recommend buying them) for $1200-1500, possibly more, which is a hell of a steep price! But for a pickup unit that is probably as close to state-of-the-art as one can get, I don't think that's an unreasonable price to pay.

If you can find a source of these in Japan (I don't know of any) and are willing to send them back there for repair if necessary (it shouldn't be), and if you can afford the price, by all means get them. Or that trouble may be obviated if we can persuade Technics USA to import them. **JGH**



Measured frequency response of the 100C Mk 4. High-frequency range matches that of most MC cartridges but is much smoother.

SONY WDM-6
PROFESSIONAL WALKMAN SYSTEM

Portable cassette recorder. Dimensions: 7" L by 3½" H by 1½" D. Weight: 1 lb, 7 ozs. Cost: $350; accessory microphone, ECM-929LT: $85. MANUFACTURER: Sony Corporation of America, Sony Drive, Park Ridge, NJ 07656.

George W. Graves[2]

One would think that, with all their enthusiastic promotion of digital audio, Sony might have forgotten about analog audio. Not so. For over a year now, Sony has had available a Model WDM-6, known as the Professional Walkman—a deluxe version of their original Walkman, which includes stereo recording capability. Not only is this the only Walkman-type cassette recorder that has high enough quality to satisfy audiophiles, it also has accessories available to make it into an amazingly good portable recording system.

The $350 WDM-6 is just a little larger than a paperback copy of *Gone With The Wind*. The machine may be powered from an optional AC adaptor, from four AA cells, or from an optional rechargeable nicad pack sold by Sony. The nicads can be charged inside the unit while it is

1 Just before press time we learned that the WDM-6 has been replaced by the WDM-6C which has the same specifications, presumably the same performance, but different (and unspecified to us) features.

2 George W. Graves is a reader who submitted this article just on speculation, and we printed it! His musical tastes range from occasional jazz to large scale symphonic and operatic works, and he works as a marketing engineer for a semiconductor manufacturer. Other readers who feel inspired to write up products that haven't already been reviewed by Stereophile should feel free to submit articles—but don't be too disappointed if we turn them down!

operating from its AC adaptor, and a fully-charged pack will run the unit for two hours continuously. That makes it a good idea to carry a couple of spare fully-charged packs if you're doing any serious recording.

The unit has a crystal-stabilized servo-controlled capstan drive and Dolby B noise reduction, high-quality microphone inputs, and it will record on metal tape as well as conventional tape formulations. But it is the accessory microphone which makes this tiny recording system so unusual. The ECM-929LT is a single-point stereo microphone about the size of a lady's pearl-handled automatic pistol, which is unusual enough in itself. But what makes this unique is that instead of being the usual X-Y stereo microphone (using crossed cardioids or figure-8s), this is a true M-S microphone!

M-S is an abbreviation for the German *mittel-seite*, which means middle-side. An M-S mike consists of two pickup elements: a cardioid element (unidirectional, heart-shaped pattern) facing forward, and a figure-8 bidirectional element with its lobes facing to opposite sides. Neither element by itself is capable of yielding a proper stereo output, but when the signals are combined in a special way, they do. In fact, by adjusting the way the signals are combined, they can be made to produce an infinite variety of pickup patterns ranging from mono unidirectional (forward only) through every stereo angle to mono omnidirectional (all-around).

The combining, or matrixing, can be done with transformers or with active devices and resistor networks. In the ECM-929LT, transformers are used and a switch on the mike itself selects transformer taps to provide unidirectional mono, 90° stereo angling, or 120° stereo angling. The choice of three modes (rather than more) is inspired by economy, since each mode requires a different combination of taps from the transformer windings, and more taps would raise the cost. If a greater variety is desired, Sony offers another accessory, the cigarette-pack-sized MRU-60 ($65), which uses resistors and solid-state circuitry, and connects between the microphone and the recorder to provide infinitely variable adjustment of the pickup pattern. It works beautifully, and in some instances its ability to control the size of the stereo "stage" is invaluable. But you do give up something in exchange. It adds some hiss, while the transformer matrixing does not. And the three patterns provided by the basic mike are adequate for most recordings.

The same resistive matrixing is used in a smaller and more expensive a smaller and more expensive Sony M-S mike, the ECM-939LT ($115), but it too is noisier than the larger, transformer-equipped one, so I do not recommend it.

With such an unobtrusive and portable recording system as this, there is a temptation to sneak it into live concerts and "cop a performance." This is not really a good idea. Not only is it unethical, illegal, and likely to get you in trouble, it won't even get you a very good recording. Hand-holding a microphone causes scrabbling noises, it can make one's arm painfully tired after a while, and the recording perspective from an audience seat is usually too distant for a good recording.

Getting permission to record a concert *isn't* impossible, particularly if the participants are amateurs, at which time you can think about proper placement of the mike. I won't get into the subject of microphone placement here because it could take up a whole book, but with the mike controller on the ECM-929 you can widen or narrow the pickup field *after* you've set up the microphone.

The first principle of recording is Put The Mike On A Stand. This is easy to do with the 929 because it has both a standard mike-stand fitting and one for a photo tripod. I use a Vivitar collapsible

camera tripod, which measures a mere 12 inches in length when folded and extends to about 48 inches when set up. My tripod, recorder, microphone, headphones, extra battery packs, and several cassettes all fit easily into an inexpensive brief case fitted with a foam lining.

As the mike has only a 6-fot cable, you will need an extension for it in order to do musical recording. The microphone's output plug is a miniature phone plug, like those used on headphones for Walkman-type units, so I investigated the possibility of using a Walkman headphone extension cable for the microphone. Its cable turned out to be shielded, which made it ideal for the purpose. Most such extensions are suitably shielded but some are not; check by unscrewing the plug cover at one end before buying. (If the cover isn't removable, don't buy it; consider another brand instead.) The mike's output impedance is low enough to allow the use of up to 100 feet of cable, but since the output is not balanced, hum may be a problem with runs of more than 50 feet.

So, what kind of tapes can you expect from this diminutive system? Well, it has always been difficult for me to assess the sound of a tape recorder, perhaps because a live recording is so close to the source (as opposed to a disc recording, which is several generations removed) that my perceptions are a mixture of what I hear and what I remember of the actual event. All I can say is that the Walkman Professional is capable of sound rivaling that from most nonprofessional reel-to-reel recorders.

The M-S recording technique has long been acknowledged as one of the most accurate ways of recording stereo, and the Sony M-S system for the Walkman can deliver uncannily accurate stereo imaging. The reproduced soundstage stretches laterally to beyond the sides of the speakers, and each instrument is placed in its own space. Front-to-back depth is excellent, and rendered with rocklike solidity. The mike sounds very smooth, and even though it is rated 3 dB down at 70 Hz, its low end *sounds* very good. In fact, my only complaint about the 929 mike has nothing to do with its sound: Instead of using a penlight cell or the ubiquitous 9-volt transistor-radio battery, it uses one of the expensive and hard-to-find silver-oxide button batteries. (Just try and find one of *those* on a Sunday afternoon!)

In short, this is a recording system for which few apologies must be made. The fact that it is so portable, and costs under $500 for a complete recording system capable of sound that would have cost several thousand just ten years ago, makes it all the more remarkable. Pretty good for a device that I bought simply to enjoy flutter-free music on airliners.

SUMO ANDROMEDA POWER AMP

Solid-state Class AB stereo power amplifier. Rated power: 200 watts/ch into 8 ohms @ less than 0.05% THD Dist.; 375 watts/ch into 4 ohms @ less than 0.1% THD. Dimensions: 19" W by 7" D by 8¾ " H. Weight: 35 pounds. Price: $899. MANUFACTURER: All American Audio, Inc., 31316 Via Colinas, Suite 103, Westlake Village, CA, 91362.

Publisher's Note: *With this review we introduce Laurence Greenhill's co-conspirator Dave Clark, who is president of the ABX company and a well-known proponent of rigorous double-blind testing.*

James Bongiorno, the engineer behind the Sumo Andromeda, has enjoyed a

long and colorful career as an audio amplifier designer. He has cast himself at times as an *enfant terrible*, exploding at audio critics and running scandalous advertisements.[1] His best known amplifier is the Ampzilla, produced by Great American Sound, but he also designed the Dyna 400. Currently Jim is living on a boat and serving as part-time consultant to the Sumo Company.

When the recession hit high-end audio in 1978-80, Bongiorno designed cost-effective versions of his original Sumo amps. These included the $750 Class A Model 9 and the $899 Sumo Andromeda. These second-generation Sumo amps present a common appearance—a tall, shallow chassis attached to a rack-width, 5 mm thick front plate with massive handles. Fortunately they do not include the noisy fan found on earlier Sumo products—a major improvement. Fans effectively diminish an amp's signal-to-noise ratio (unless one runs the amp in another room).

Because its output circuit is configured into a full-wave balanced bridge, the amplifier has no common grounds except at the inputs. The unit's recessed banana jack speaker terminals underline the importance of avoiding ground connections at the output, such as might occur with speaker switchers or headphone boxes. Bongiorno also designed the Andromeda without current limiters, using instead a single 7.5 amp Slo-Blo AC fuse mounted on the rear panel and 4 quick-blow, 7 amp internal (and hard to reach) fuses to protect the amplifier.

Sumo recommends that an outboard RC circuit be connected between the Andromeda and certain electrostatic loudspeakers. These kinds of speaker loads function like a short circuit at the subsonic frequencies of record warps (due to the decreasing impedance of inductors at low frequencies), putting an enormous strain on an amplifier. Sumo's president, Richard Pley, reports that no problems have arisen in the field from driving electrostatics, but I was unable to audition the Andromeda on an electrostatic.

The Andromeda measured less than 0.028% Total Harmonic Distortion plus Noise (THD + N) at its rated power into 8 ohms, and less than 0.053% THD + Noise into 4 ohms at 324 watts per channel. The amplifier could not produce more power at 4 ohms, going into mutual conduction when pushed further.[2] This was evidenced by a sudden increase of current draw, which suddenly jumped from 15 to 25 amps. This condition is unlikely to occur when playing music, but the measurement does indicate a failure of the amp to meet its specs.

How does the Sumo Andromeda sound? It produces a surprisingly smooth, transparent sonic texture. Stereo imaging is exceptional, with outstanding inner detailing. In particular, the Andromeda is capable of generating a very wide soundstage while maintaining clear delineation of instruments and voices. The unit also proved to be much less harsh or bright during overload than is my Threshold Stasis 3,[3] without showing the overly mellow sound or slight loss of detail found in the VSP Labs 150.

On the Snell A/IIIs the Andromeda showed tremendous midrange smoothness, with great separation of instruments and voices when using the amplifier in a biwired mode (see the Snell A/III review in this issue). In particular, it rendered the brass in an appropriately aggressive and unsettling manner, for example during the first movement of Stravinsky's *Rite of Spring* (Telarc CD-80054), but with none of the white hot, overbright glare heard from many other solid-state amps.

Yet the Andromeda does not sound artificially sweet or smooth; it simply adds

1 The most sacriligious was a full page cartoon of a gorilla (the symbol of his former Great American Sound amplifier products) nailed to a cross in an advertisement which appeared shortly after Bongiorno left G.A.S.

2 Mutual conduction occurs when the complementary output devices (which normally work in turn) conduct current simultaneously, and thus work against one another, behaving like a partial short circuit across the power supply.

3 The Stasis 3 is two generations previous to the Threshold S500/II that shows up in the latest Recommended Components.

little brightness of its own. The amp's low end is very decent: solid and dry, without the fullness of the VSP or the thunderous power of the Levinson ML-9. Only the ML-9 significantly bettered the Andromeda in very deep bass performance, but at three times the price. In my opinion, the Sumo runs a close sonic second to the ML-9 or the $3495 Spectral DMA-100. Performing at just below this class of amplifiers, the Andromeda is clearly a bargain.

What is important to the consumer is Bongiorno's implementation of a high-end amplifier design at a relatively low cost. Bridged output circuits clearly can be made to sound very good, and offer extra reliability for bipolar output transistors. The Sumo Andromeda's low price tag, high power, clever design, and outstanding sonics on dynamic loudspeakers makes it a real find in the present day marketplace of "me-too" basic amplifiers. It is one of my favorite amplifiers for driving Dahlquist DQ-10s, Snell Type A/IIIs, or, with care, the Spica TC-50 dynamic loudspeakers. The Sumo amplifier represents an audio "best buy" and I recommend it with enthusiasm.

LG & DC

REVOX B77 mkII TAPE RECORDER

Two-speed three-head open reel tape deck with off-tape monitoring. Half- or quarter-track versions available. Supplied with any of two adjacent speeds from 15/16 to 15 ips. Inputs: mike, line, and DIN (unbalanced). Specifications: Record/playback response 30 Hz to 22kHz, +2/-3 dB; Wow and Flutter: 0.06% weighted peak; S/N 67 dB. Weight: 38 lbs. Dimensions: 16½" H by 17¾" W by 8¼" D. Price: $1800. IMPORTER: Studer/Revox America, 1425 Elm Hill Pike Nashville, TN 37210.

Plus ca change, plus c'est la meme chose, is an apt expression with respect to the Revox 77 series. As it was with Volkswagen's Beetle, Revox has retained their basic design and continued to refine it. Although there have been countless mechanical and electrical changes, anyone owning the original A77 could operate a B77 II without so much as a glance at the instructions.

This desire to retain continuity (or, perhaps, an unwillingness to change) has produced a recorder with a decidedly quaint flavor. In Europe, Revoxes were traditionally targeted at the audiophile, or perhaps the amateur musician; Studer machines (same company) were for pros. But Revox has always cost more than Japanese or American recorders, so over here they've been aimed at the serious amateur or impecunious professional,[1] and as inflation caused the price to rise faster than incomes, the 77 series became increasingly seen as strictly professional. With Akais and TEACs selling for less than ⅓ the price of a B77 Mk II, one must be dedicated indeed to own a Revox.

The result is a machine that, although nominally professional in sound quality and construction, still thinks it's an amateur recorder of the early '60s! The Revox is so different from most Japanese (or even European) decks, that I'll spend a few paragraphs discussing these differences.

The Revox reveals its ancestry as a

1 And the not-so-impecunious; Dave Wilson made many of his exceptional recordings on a highly modified A77 mk IV, and Proprius still uses the tubed G36.

home recorder in several obvious ways. There is no tension arm on the take-up side; the tape simply feeds on to the reel without any mechanical isolation other than the right-hand tape guide. This results in a slight, but noticeable, bobble in the sound when the tape starts. Nor is there any mike/line mixing, since it is assumed one will be either recording live from only two mikes, or dubbing disks, but not both. (Willi Studer must never have heard of 'Music Minus One'!)

A tiny rotary switch selects among Mike, Mike with 20 dB attenuation (via front-panel ¼' phone jacks), Radio (DIN-level, via a rear DIN connector), Auxiliary (standard U.S. levels via rear phono jacks), and the output of the other track, for sound-with-sound recording (this last feature is especially reminiscent of consumer decks from the '60s).

Although it's not likely, this switch *could* accidentally be turned, ruining a recording. This cannot happen with the conventional mike/line mixing (or line-only inputs) on most other machines.

One of the most serious failings of Revoxes is their inconvenience of tape editing. The head array sits below the front panel, greatly reducing the space to maneuver one's fingers, the tape, or a china marking pencil (most other decks have the head block *above* the front panel). And although Revox includes a tape cutter on the splicing block, the block is inconveniently located to one side.

I do not wish to needlessly denigrate the Revox, which is really an exceptional machine, but rather to point out that its ergonomics are in serious need of upgrading. Note, for example, that the Revox fails to group the record interlock switches or mike inputs together, and its record level controls are not under their corresponding meters. And although the Revox has a pause control, *it does not lock*!

Cassette decks have all but destroyed the under-$1,000 open-reel deck and digital processors at less than $2,000 are now threatening two-channel open-reel machines in *all* price ranges. The main justification for choosing the open-reel format these days is the ability to do tight edits easily, and a lot of cheaper Japanese decks make this easier than does the B77. Additionally, their superior ergonomics make them far easier to get used to. As the market for consumer open reel diminishes it becomes increasingly important that open-reel deck designs be more carefully thought out. Revox ought to pay closer attention to the needs of this specialized market than is reflected in the B77. (Revox also makes a PR99 Mk II 'professional' deck, priced at $2250---about the same as the Otari MX-5050 that was reviewed in Volume 5, Number 10. We expect to get a PR99 to compare to the Otari in the near future.)

MEASUREMENTS

As received, the record and play heads were correctly aligned. (I have yet to see an open-reel machine where this was *not* the case. Cassette decks, on the other hand, are almost invariably misaligned.) Although Revox recommends a tape with their own number on it, a sample of Scotch 206 was supplied.

The frequency response, as measured with the supplied 206, showed a dip in the upper midrange followed by a rise in the top octave, a common failing of both open-reel and cassette decks. The deck had been set for 7 dB overbias at 10 kHz, which seemed excessive (Revox confirmed this, saying it was normal for the deck). I reduced the overbias to 3 dB, and then tweaked both bias and record EQ to get the beautifully flat response you see here. The Revox provides a wide range of adjustments, which are easily accessible. The final bias level was about 4 dB over-bias at 10 kHz.[2] The response shown is at 0 VU, which I reset to 200 nW/m.

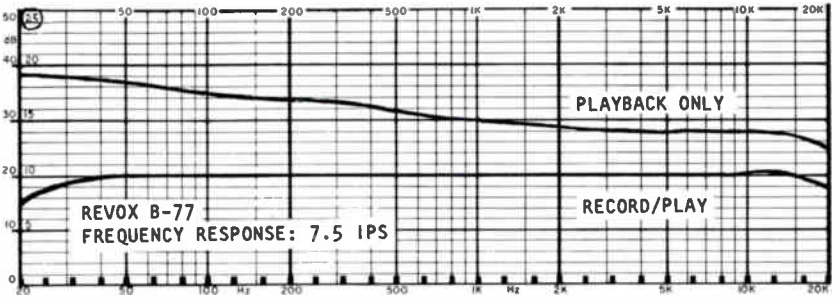
2 Overbiasing is measured as the amount by which a high frequency (typically 10 kHz) is biased to *beyond* its peak output. Thus, a 4-dB overbias would be the condition where a 10 kHz signal is biased, first to peak output, then additionally until its output drops by 4 dB. JGH

Of course, bias has a pronounced effect on distortion. Generally, distortion drops as bias is increased. Although I reduced the bias, harmonic distortion was an outstanding 0.2% @ 400 Hz, 0 VU, half that of my Otari 5050 and one-fourth that of my Nakamichi 680. The 3%-distortion point was not reached until +12 dB, which is common for open-reel; this seems more dependent on the tape than the deck. Since the reduction in bias allowed a corresponding decrease in recording pre-emphasis, more high frequency energy could be recorded without saturation after my rebiasing.

Wow and flutter were 0.03% peak weighted, 0.06% peak unweighted, much better than specified. The overload light came on at +5 dB, which is very conservative. Otari, and most other manufacturers, set the light at about +12 dB, the 3% distortion point. S/N ratio, unweighted, was 54 dB on the left channel, 47 dB on the right. This imbalance is all too common; the excess noise here, as is usually the case, was low-frequency garbage and hum. A-weighted, both tracks improved to 59 dB. If you consider that my 0 dB reference is 2 dB below Revox's, that I was slightly under-biased (by their standard), and that the S/N reference is probably the overload light, not 0 VU (the instructions don't say), then we get 66 dB, essentially meeting their spec of 67 dB. This is better than average for a quarter-track deck.

One test result that needs explaining is the rolloff in high-frequency playback response. Revox acknowledges it, and says it is a property of the Magnetic Reference Laboratories tape I use for measurement. Since none of the other open-reel machines I have measured show this rolloff, I contacted Jay McKnight, head of MRL. Jay feels the rolloff is actually in the head, and has three causes: high-frequency eddy current losses; a gap length[3] that is probably too great for a 3.75/7.5 ips recorder; and a head finishing process that causes the

3 The playback head is a tiny horseshoe magnet. You would think the space between the poles would be called the gap *width*. Wrong, oxide-breath! The dimension of the head which corresponds to the width of the track is called the *gap* width. This leaves the pole spacing to be called the gap length. These terms are universal, and confusing at first. If you wish to study magnetic recording technology in more detail, get Jorgensen's *Handbook of Magnetic Recording* (TAB Books 1059). This appears to be the only English-language publication that covers magnetic recording in depth.



Frequency response of the B-77 deck. Vertical scale is 1 dB per minor step.

upper surface of the head to lose its permeability, creating a spacing loss that reduces HF output. Jay also told me that MRL uses Studer heads for their own reference measurements!

What my measurements *don't* show is the remarkable uniformity between channels. Both were essentially identical with respect to frequency response and distortion; this is the first analog recorder I have measured where this was true. It reflects not only great care in design and manufacture, but also the refinement of a single design over 15 years.

Mechanically, the Revox has the kind of feel one expects from a high quality product. Disassembly showed large, well-finished castings on a cast frame. The Revox should withstand quite a bit of unintentional abuse.

THE SOUND

The B77 was compared with my Otari 5050 by recording live music, not by dubbing records. Both machines were fed from the same mike/preamp combination, and dbx II noise reduction was used with both. On playback, the tapes were synchronized so that a quick comparison could be made, if needed.

Much to my surprise, I could not tell the machines apart! Under identical test conditions, the Sony PCM-F1, Otari, and Nakamichi 680 could easily be distinguished. But in this comparison there were no apparent differences in transparency, detail, dynamics, imaging, cleanness, image stability, and overall coloration. The two open-reel machines were about as alike as Tweedledum and Tweedledee. A toss-up.

On the other hand, there *were* noticeable differences when playing commercial tapes. The Revox resolved detail a bit better, but also was a bit grundgier in the midrange, and had a slightly 'twangy' or metallic quality on plucked double-bass. For handling 'foreign' tapes my vote goes, by a narrow margin, to the Otari.

RECOMMENDATIONS

If their prices were the same and there was a significant difference in sound quality between the Revox and the Otari, a choice would be simple, but neither was the case. The issue is further clouded by the superior sound available from digital processors. (See my comments about the Nakamichi DMP-100 in Volume 7, Number 5.) So let me try and draw some reasonable guidelines.

1. Unless you're recording for commercial release, and will need to edit notes or phrases during musical sections. Two-channel open-reel recorders no longer make much sense to me. Digital recorders are sonically more accurate, easier to carry, and the tape costs less per hour. If you already own a suitable VCR, or intended to buy one anyway for taping off TV, then its cost is not part of the package, making a digital recording system even cheaper. Analog's only advantage is its ability to make tight edits on a single machine. Editing digital tapes requires two VCRs, and is limited to simple excision of applause or large chunks of a performance (such as a bad start). The importance of this will depend on the kinds of recordings you have to produce; even to many amateur recordists editing is crucial.

2. If you only want to play commercial open-reel tapes, it makes little sense to lay out $1500 to $3000. Although I have not auditioned anything in the under-$1000 range, there may be good-sounding machines there. Or you could buy a used Otari, Revox, or Tandberg.

3. If you simply must have open-reel for live recording, it seems to me that a 4-channel machine makes more sense than 2-channel. The money spent on the extra mikes, preamps, and noise reduction buys real flexibility. For example, a choir and an orchestra can each have its own stereo mike pair. Or you can experiment with different mike patterns or layouts, and A/B the results from the same tape. Or you can pick up ambience in an overly-dry hall and mix it in later as desired. And you have the reliability of two backup tracks.

Choosing between the Revox tested here and the Otari reviewed back in Volume 5, Number 10 can be done on

the basis of price, features, and measured performance. Although they sound pretty much alike, the Revox is a substantial $500 cheaper, has better specs, and is more easily transportable for on-site live recording. For $500 more, the Otari (and perhaps the as-yet-untested Revox PR99) has substantially more useful features, and is easier to operate. The B77 is really at the top of consumer-oriented tape machines; the next step is semi-professional. **BS**

Publisher's Note:
Just prior to publication we received a phone call from Revox expressing appreciation for the particulars of the B77 by itself, but objecting to the comparison with the Otari. Sam Borgerson of Revox pointed out that the Otari costs $495 more than the B77 Mk II; in the immediate price range of the Otari, Revox makes a model similar to the B77 Mk II, but with significant professional features. Called the PR99 Mk II, it features a real-time counter (hours, minutes, and seconds), significant user access to various portions of the tape (precise 0 locate, address locate, repeatable play of any section of the tape), balanced line inputs and outputs, self-synch, and variable speed (also a feature of the B77 Mk II). The PR99 Mk II costs $2250 and is said to contain similar electronics to the B77 Mk II, and should sound just about the same.

Revox also would like to challenge Otari to a 'drop test'; each company would supply one of their machines to be dropped until failure, with the winner to be the machine that makes it to the greatest height! We'll keep you informed of Otari's response.

THREE BUDGET TUBE PREAMPS

Once upon a time, all audio equipment used vacuum tubes. In recent years, however, tubes have become the exclusive province of super high-end audio. It is more expensive to accomplish any particular task with tubes than with transistors, and few manufacturers (with the exception of Conrad-Johnson) seemed willing until now to refine their techniques and pare back their budgets to make tube components more affordable.

The success of expensive tube units, however, has prompted a number of manufacturers to offer "budget" tube preamplifiers. Though still not cheap, they come in at prices just a bit higher than the least expensive solid-state preamps (Hafler, Kenwood, etc.). Consequently these lower-cost tube units are enjoying more than a little success.

In this report we're reviewing three of these budget tube preamps (in alphabetical order): the Audible Illusions Modulus ($450), the Conrad-Johnson PV4 ($485), and the Counterpoint SA-7 ($495).[1] The design philosophies of the three are similar in a number of ways: each uses dual triodes in varying numbers; all are products of the minimalist school, having no tone controls and only the most basic of features; all three preamps invert polarity; and all three designs produce sizeable turn-on and turn-off noises—be sure you turn your amp on last and off first.

As similar as these preamps seem in price and design, they sound radically different—more so than anticipated. Except for the lack of a typical transistor sound, none of the three neatly fit the stereotyped notions many audiophiles have of tube equipment. In fact, I've heard several solid state preamps that have more of the characteristics customarily ascribed to tubes than do

1 By the time this report came out, the price of the Counterpoint had increased to $595.

these units.

Despite their differences, I found both the PV4 and the Modulus to be capable of remarkably good performance in view of their relatively modest prices. The SA-7 proved to be a far less successful attempt and cannot be considered as being in the same league with the other two.

THE AUDIBLE ILLUSIONS MODULUS

Stereo vaccum tube preamplifier. Inputs for Magnetic phono (MM), Aux, and Tape. Mute switch, remote power supply. Separate volume controls for each channel, no balance control. Price: $450. MANUFACTURER: Audible Illusions, 1266 Leigh Ave. #5, San Jose, CA 95126. DISTRIBUTOR: Apax Marketing, 18902 Lamson Rd. Castro Valley, CA 94546. (415) 886-2492.

The Modulus is a basic black and silver box, though somewhat more attractively styled than the C-J PV4 (see below)—a wider, sleeker box suitable for rack-mounting. The separate volume controls for each channel at first seemed cumbersome to use, but were easy to get used to. The power supply is housed in a separate unit, the cord to which is not detachable; i.e., the power supply must be carried with the unit whenever the preamp is moved. Also, the 42-inch length of the cord is somewhat shorter than I would have liked.

The Modulus excelled in several areas where the PV4 fell short. High frequencies were nicely extended and open, free from noticeable hiss or grain, and open sounding. The upper midrange/lower treble was slightly dry, and instruments such as cymbals sounded just a bit forward. Female voices tended to be somewhat sibilant.[2]

Bass extension was exceptionally good for a low-priced tube unit. There was a slight softness in the very low bass, but level and weight were very good all the way down. The upper bass/lower midrange was slightly warm, but not noticeably accentuated.

Dynamics also were good. The Modulus did particularly well in this regard on percussion and piano, the difference between pp and ff being shown with exemplary accuracy. The Modulus did, however, occasionally sound congested during very high-level, complex orchestral passages. In these instances the soundstage would collapse, the result being a constriction of sound and a confused image.

Detail and harmonic contrasts were good, though the Modulus did not equal the PV4's outstanding abilities in this area. In fact, I was surprised at the amount of detail presented by both the Modulus and the PV4—no mushy tube sound in either case. Image width was good and depth fair but, like the PV4, individual instruments and voices were a little too broad.

2 I was more impressed with the Modulus than was SWW, possibly because my sample of it was better than his. I felt the high end was very good, and did not notice anything I would describe as a "zippy" quality. In fact, I think the Modulus is a steal at its modest price. JGH

THE CONRAD-JOHNSON PV-4

Stereo vacuum tube preamplifier. Inputs for magnetic phono, Aux, and Tape. Separate volume and balance controls. Price: $485. MANUFACTURER: conrad-johnson design, 1474 Pathfinder Lane, McLean, VA 22101. (703) 528-8650.

The PV4 was my favorite, not because of the greatness of its strengths but for the relatively minor and easily tolerable nature of its flaws. If this sounds like winning by default, remember that you're not going to get state-of-the-art for under $500. The biggest challenge the designer of a budget preamp faces is how to avoid making it sound terrible, not how to make the product sound marvelous. This is a goal the C-J team has accomplished very well.

In appearance the PV4 is distinctly plain: a basic black and silver box with a few simple knobs and buttons. The controls are logically laid out, clearly labeled, and work properly. The two channels track well through the volume control, maintaining balance; pushbuttons and control knobs have a smooth, solid feel (except for the noises audible through the system when switching inputs). Don't forget the turn-on and turn-off thumps mentioned above; the PV4 is the only one of these preamps lacking a mute switch.

The most noticeable flaw in the PV4 is a moderate subjective rolloff in the high frequencies. If a compromise has to be made somewhere, this is a reasonable choice. In view of the high-frequency performance of speakers and amplifiers with which the PV4 price range will probably be used, it may even be a blessing in disguise. Bass is good, though not outstanding. Weight and authority in the low bass are only fair, and the bottom octave has a one-note sound making deep basslines hard to follow. However, this is only obvious on a speaker and amplifier combination capable of reproducing the bottom octave with reasonable accuracy and authority. With most lesser speaker/amplifier combinations, more typical of what one might use with a sub-$500 preamp, the PV4 is capable of taxing their bass extension limitations, and then some.

Soundstage width is good, though somewhat lacking in focus. The PV4 also seems to reduce dynamic range just a bit. But these are not the kinds of flaws that make a component sound bad; rather, they merely prevent it from sounding great. On the plus side, the PV4 is clean, open sounding, lucid, has excellent detail, and has an outstanding ability to convey the feeling of a live performance. Inner detail is amazing for a component of this price. Though it certainly doesn't rival C-J's Premier 3, it is relatively easy to distinguish individual voices in choral works or to count the number of horns playing in a fanfare.

The overall tonal balance is good, save for the HF rolloff and a bit of warmth in the lower midrange. The PV4's ability to convey contrasts of instrumental timbre exceeds most units I've heard at twice its price. The relative tonal differences between similar-sounding instruments, such as oboe and English horn, are conveyed with exemplary accuracy. This quality, together with the PV4's excellent detail, causes one to forgive its mild midrange colorations.

The PV4 paints with a broad brush; both instruments and vocalists often seem overly wide. Depth is fair, but the PV4 does not present the marvelous, 3-dimensional soundstage achieved by the most expensive tube units. Ambience is not conveyed well, and it is difficult to gauge the size of room in which a recording was made. Everything sounds as if it were recorded in a large, somewhat dead, hall.

The most impressive characteristic of the PV4, in view of its price, was its ability to sound just plain musical, without excessive coloration or loss of detail. Other budget preamps manage to sound

"musical," but their musicality generally is obtained by glossing over details and adding coloration. The essential musicality of the PV4 makes it very easy to live with, even in a state-of-the-art system, which is quite an achievement for a low-priced unit.

THE COUNTERPOINT SA-7

Stereo vacuum tube preamplifier. Inputs for Magnetic phono (both MM and MC), Aux, and Tape. Mute switch. Separate volume and balance control. Price: $495. MANUFACTURER: Counterpoint Electronic Systems, Inc., P.O. Box 12294, La Jolla, CA 92037. (619) 453-9090.

In appearance the SA-7 is quite attractive, possessing the thin, low-profile look currently in vogue. As with the Modulus, there is a mute switch which (if you remember to use it) protects your amplifier from the preamp's turn-on and turn-off thumps. Unfortunately, the volume control on my unit didn't track accurately, and it was necessary to adjust balance with each change in volume. One unusual feature: the balance control allows very fine gradations in balance adjustment (a large movement of the control results in a small change in balance).

I did not spend nearly as much time auditioning the SA-7 as I did the other units, because it was somewhat unpleasant to listen to. The first of the two samples I received had a fairly harsh, glassy, overly prominent upper midrange that quickly caused listener fatigue. This not only affected instruments with fundamentals in this region but caused problems in the midrange as well, by coloring the upper harmonics. It was difficult to distinguish violins from violas, trumpets blared excessively, and tenor sax became honky sounding. The SA-7 also was slightly bass-shy.

Still, this first sample was not without virtue. The soundstage was excellent, both in width and depth, with good centerfill and image stability. The size of the instruments was right, and an excellent sense of 3-dimensionality was conveyed. In fact, were it not for the upper midrange glare, and resultant distortions of musical timbres, the SA-7 would have been a very good performer.

On the strength of Counterpoint's reputation for producing outstanding products, a second SA-7 was requested. The best that can be said about it is that it sounded different from the first. The upper midrange glare was gone, but generally the preamp was mediocre. The sound was slightly grainy, and seemed rather flat, both in terms of dynamics and depth of image. Though not as bad as listening to a distant station on FM, there were unfortunate similarities.

The SA-7 *was* the only one of the three units with sufficient gain to allow a low-output moving coil to be run directly into the phono stage. However, this did not prove an advantage. On the first unit, the glare was increased when using low-output moving coils; on the second preamp, noise was intolerable.

Publisher's Note: SWW's original review of the SA-7 aroused significant concern at Counterpoint, in response to which a sample was requested for audition in Santa Fe by JGH (SWW's original sample was from a dealer). JGH's comments on the second sample: "Coarse high frequencies, murky upper bass and lower midrange, significantly foreshortened depth presentation. No significant additional brightness." Please not that this coincides almost exactly with SWW's observations about that preamp.

After SWW returned his second sample (JGH's first) to Counterpoint, it was discovered that that sample might have

been defective. Following certain production-line changes, a third sample was shipped to JGH. JGH's comments on the third sample: "Overly bright, fatiguing sound. Somewhat warm and loose low end. Noisy. Not in the same league with the Modulus."

Two things emerge from our experience with three samples of the Counterpoint SA-7: the preamp can be expected to vary from sample to sample; none of the samples were sonically neutral or enjoyable to listen to over a long period of time.

INTERCONNECTS

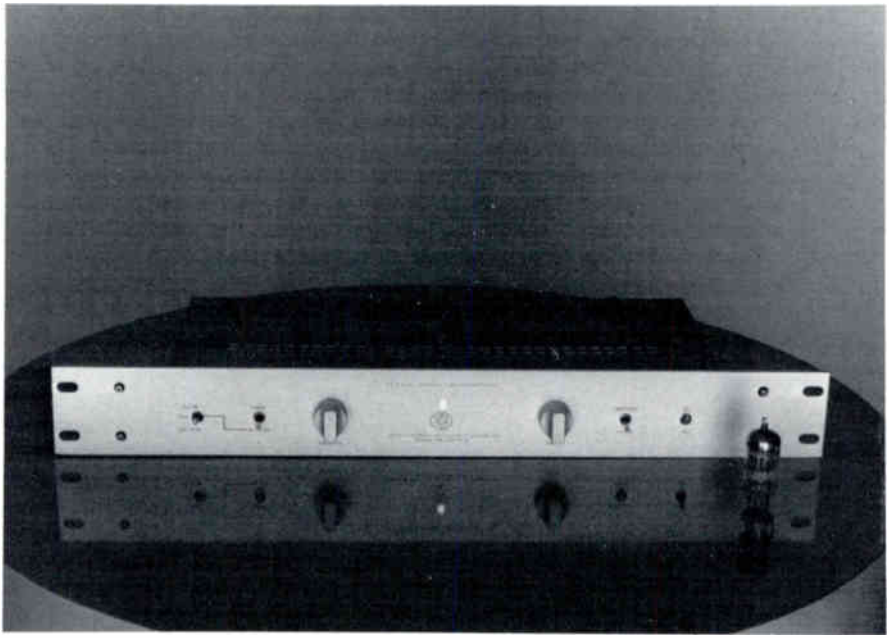
Since all of these preamps have higher output impedance than most solid-state preamps, cable matching becomes fairly important. The PV4 was the least affected by the type of interconnect cable used, and had no trouble with higher capacitance cables. This is probably due to its significantly lower output impedance, which makes it less affected by the load it is driving. I found the PV4 to sound most neutral with both the Monster Reference cable and a high-capacitance prototype cable. The Straight Wire Premium, also a higher capacitance cable, worked well, producing a more detailed sound than the Monster cable, but accentuating the PV4's midrange warmth. Both the Modulus and SA-7 underwent substantial changes as different cables were tried. Higher capacitance cables gave the Modulus some problems and proved a disaster on the SA-7. Monster Cable was the clear choice for the SA-7, while Monster Cable and Apature both worked nicely on the Modulus. Many of the other audiophile cables caused excessive brightness, particularly with the SA-7.

CONCLUSION

Both the PV4 and the Modulus offer very good performance, and can be highly recommended in view of their prices. I suspect the choice between the two will depend greatly on the other equipment with which they will be used. The PV4 would seem the clear choice with speakers such as the Stax F81s or Quads, which are capable of showing the PV4's ability to reveal detail and harmonic contrast, but not fully capable of utilizing the Modulus' dynamics and frequency extension. The Modulus, on the other hand should mate well with speakers such as the Linn Saras or Dayton Wright LCM-1s, which have good dynamics and frequency extension, but which are not capable of revealing the nth degree of detail. I tried the PV4/F81 and the Modulus/DW combinations, and found both to work very well.

The differences between the Modulus and PV4 also point out that though both products offer good value for money, neither approaches perfection. I came away from this review with a hunger to try their bigger brothers, the Uranus and Premier Three. Before buying one of these low-priced units, potential purchasers should be aware that for under $500, a tube or solld-state preamp must incorporate some compromises. In my opinion, however, both Conrad-Johnson and Audible Illusions have done an excellent job of compromising.

SWW



Counterpoint SA-7 Dual Channel Tube Preamplifier

"If I summed up by saying this is (the SA-7) an excellent product, well worth auditioning for any high performance record playing system, I'd be underplaying my enthusiasm for what I believe to be one of the most musically satisfying preamplifiers I have yet heard."
— Hi Fi Answers, England

"You can sense the positioning or instruments and performers, you can 'witness' the dimensions of the hall...with alarming accuracy...which leaves us with the Counterpoint as a preamplifier worthy of inclusion in systems where the least expensive unit costs more than the SA-7."
— Ken Kessler, Hi Fi News & Record Review, U.K.

"Expensive capacitors and precision metal film resistors mounted on an epoxy laminate circuit board bespeak more than casual concern for quality." — High Fidelity, U.S.

"The sound was 'alive', highly detailed, and articulate. There was no evidence of valve 'softness'; instead the SA-7 showed crisp firm control right through from bass to treble. The midrange was unforced, almost 'liquid' in rendering the natural tonal colouring of brass, woodwind, and singing voice. Good depth and ambience were also shown..." — Martin Colloms, Hi-Fi News & Record Review, U.K.

Write or call Counterpoint for the whole story.

Counterpoint Electronic Systems, Inc.
P.O. Box 12294, Dept. S
La Jolla, CA 92037
(619)453-9090

HAVING A GRAND'S TIME FINALE!

Anthony Cordesman

The concluding half of Anthony Cordesman's all-encompassing survey of available signal sources that you might consider spending those excess Gs on. This time: Beta HiFi, PCM processors, and cassettee decks.

INVEST IN A BETA HI-FI?

This brings me to Beta HiFi. I have already said that I prefer the Tandberg operating at 15 ips half-track to Beta HiFi. On the other hand, the differences between Beta HiFi and open reel are relatively small; in fact, I prefer Beta HiFi to today's digital processors and high end cassette players.

Let me add a few points, however, to the open reel versus Beta HiFi comparison. The Tandberg 20ASE does have some residual hiss. Beta HiFi has a faint touch of hum and is slightly bright, but has far less hiss. The Tandberg requires very careful attention to levels to get the best S/N; so does Beta HiFi. In short, it's a tossup between them unless you're willing to go through the whole 15-ips bit.

If you carefully check out your Beta HiFi unit before buying—frequency and distortion measurements are essential to ensure the audio section is working well—Beta HiFi will outperform any high end cassette deck I could find, not to mention open reel tape recorders like the Revox B-77 Mk II. If you then add a little gold-plating, such as bypassing or replacing every audio capacitor in the signal path, Beta HiFi is a true rival to the sound of the Tandberg 20ASE.

Now consider the fact that the Beta HiFi is also a very good Beta video recorder. You get audio and video, and the Sony 5200 model is discounted widely for about $650. This makes me award it a "best buy" for your grand if you do not already have a large VHS or open-reel tape library, and if you want to combine video with stereo in your home.

Don't go overboard, though: Beta HiFi is not fully competitive with the best analog disc-playing systems, and cannot copy the level of detail and dynamics available on the best compact disks. It is linear, does not introduce fatiguing forms of distortion, the midrange and upper range can be sweet, and low level passages have good to very good (but not excellent) detail. Its upper octave and deep bass are not equal to either vinyl or digital disc, but Beta's upper octave outperforms the Compact Disc in freedom from listening fatigue, if not in transient detail.

Beta HiFi lacks the air you get with the better moving coils and slightly restricts depth. It is not as musical in the midrange as analog discs or open-reel tape. In short, it is a very good product which leaps into the lower half of high end sound in its first generation, and which sounds even better if you replace the capacitors—but be sure to check out the individual unit you buy.

The latter point is important. I bought the Sony 5200 because it seemed to be much better made than the 2700, but it took lots of adjustment and the two stock 5200s I had on loan both sounded slightly different. One had a rolled-off upper octave and one didn't. I can't recommend the 2700: the effective price is almost twice as high, it has had consistent problems in the highs, and is inferior as a video recorder.

Obviously, Beta HiFi is something you

should buy from a dealer who will check it meticulously, and let you audition it on a money-back or exchange basis. You will need a dealer who will handle service—but this is true of any tape machine. You are dealing with trouble-prone and highly complex devices; if you don't have a dealer to help you when things go wrong, you will rapidly learn that discounting is simply a way to make money without having to stand behind the product.

I have mixed feelings about the overall result with video. The sound outperforms the picture. The combination of picture and sound could, in fact, be disturbing: I was constantly struck by hearing more than I was seeing, even when I used a Sony 25" profeel monitor or a 46" large screen unit.

I also found that speaker placement for good stereo music produces too large an image. It is like going to a symphony orchestra, hearing natural sound, and peering through one of those little cardboard tubes that comes inside a roll of toilet paper. You have to put the speakers close to the TV set, and roll off the audio frequency extremes to get proper balance. And no matter what you do, you still are seeing light at the end of a tunnel. Even so, watching a program with Beta HiFi audio is far better than watching a program with conventional TV sound. The stereo effect on the three tapes I had with stereo and picture did a great deal to make up for shortcomings of the picture, and the unit is perfect for the opera lover. You get hours and hours of good sound without changing anything.

My slightly tweaked 5200 had a better picture than most RCA videodiscs, and was only slightly inferior to the Pioneer LaserVideo, but had fewer glitches, picture problems, etc. Sonically, Beta HiFi is in the high end bracket, RCA is low-fi, and the LaserVideo disc is in the bottom half of mid-fi even with CX.

Punchline: With proper care and dealer support, Beta HiFi is one of the grandest times around. Fine for audio archiving (though not equal to the best open reel), and allows video recording in stereo as well, but like PCM and cassette, you can't do tight edits. Note, however, that the Beta 2710 is out, the Sanyo units seem to equal the Sonys, and there is a portable Sanyo Beta HiFi, not to mention a Toshiba 4-head Beta HiFi machine.

INVEST IN A DIGITAL TAPE RECORDER?

You will not hear any diatribes from me against digital processors or tape recorders, but I do feel an investment in such units is premature. In my opinion they're a year or two away[1] from having the combination of filters, phase linearity, good audio stages, and price to qualify as high end products.

But I don't give a damn what Ivor's clones (clowns?) say about the Sony PCM-F1. If you stack it up against most open-reel tape recorders, it wins hands down on a master dubbing.

I would argue that the Tandberg 20ASE has a better audio stage and more natural midrange and highs, but the Sony has absolute stability of speed and pitch, superior frequency response, better amplitude linearity, and few problems in the deep bass.

I have also briefly had the opportunity to listen to a PCM-F1 modified with a better filter, truly high grade capacitors, and a cleaned up audio stage. It did rival the Tandberg in the midrange and seemed excellent on original master tapes except for some nagging hints of irritation and listening fatugue in the upper two octaves.

I should hasten to add that the modifier put at least the cost of the entire Tandberg into gold plating the Sony and that the end cost to him of the modifications plus the PCM-F1 processor alone was about three times the price of the Tandberg.

As for Beta HiFi, Beta is not as linear and doesn't measure as well. Even on a master recording or single dub—the only conditions under which the PCM-F1 does not begin to seriously degrade musical quality—Beta HiFi is more

1 Make that 6-18 months away; it's taken that long for this article to make it into print.

musical and has video capability.

I can't say as much for some other units. I have had a borrowed Technics SV-P100 and Hitachi PCM-V-300 in my system for two days each. These are combined digital processors and video tape transports selling for $3,000 and $3,500 respectively. The Technics and Hitachi test out well, and they do many things quite well—although not necessarily play tapes made on the other brand. Unfortunately, the highs are just what people complain about with digital, and they did not compete with the Tandberg 20ASE or Beta HiFi for transparency or sonic purity in the top three octaves. This kills them dead as far as I am concerned, since Beta HiFi costs about a third of either unit, and has video tape recording capability. I have not tested the Sansui PC-X1, but the users I've talked to indicate it's at least somewhat better.

As for using any such units in live recording, I wonder.[2] I did not have identical units to try dubbing and editing, but everyone I talk to tells me that tight editing with today's consumer digital units is almost impossible. I also can confirm the many grim reports about what happens on the second or third dub, and there is good reason that the more demanding recording buffs feel even one dub with the cheaper digital units is one dub too many.

Joe Grado has made demonstration tapes with the Sony that reveal a sharp increase in the more irritating aspects of digital highs after one dub. This is one hell of a drawback compared to an open reel unit like the Tandberg, where the original tape can be edited and the sound quality degrades gracefully and harmonically. John Myers and Dennesen evidently have filters that can help with this problem, but I haven't tested them and they are in the $600 buck and up bracket.[3]

My guess is that, if you want to archive with digital to achieve *ne plus ultra* copies of records or off the air sound, you should wait for the next generation or two. The right generation should be easy to detect: look carefully for explicit and highly detailed specifications on phase linearity and low level distortion (specs for -50 dB rather than -30 dB and above), and claims of increased quality in the audio stages. Then go out and listen; listen to second or third order dubs (which will reveal superior error correction circuits). If the machine really has solved digital's teething problems, it should be able to preserve high-end sound quality after multiple digital dubbings.

The next generation may be *the* generation if Sony learns from its Compact Disc experience and realizes that people can hear the difference both in terms of the upper end and the high level audio stages. Sony does some truly superb innovation and engineering, but it does—like most Japanese manufacturers—need to listen more and clean up its audio. Basics, friends, basics.

Punchline: not yet a grand enough time.

INVEST IN A CASSETTE PLAYER?

Hmmm. I am now on my sixth type of media; fair enough, it ranks sixth in overall sound quality. Industry practices have killed the potential of prerecorded cassettes, and the high end cassette decks thus end up being judged as record/playback devices for archiving or making tapes for the car and the Walkman. Pity, because the machines are excellent and have great potential.

There is an old joke about America being the only nation that ever went from barbarism to decadence without passing through civilization. Unfortunately, prerecorded cassettes seem to be going from the home to car players without ever passing through the high end. I have owned cassette players ever since Philips' first machine, and have looked for years for a true high end cassette. I constantly try out new metal and chrome versions; I watch Angus McKenzie's "cassette

2 I damned sure don't; it's convenient, the overall sonic quality is excellent, and I have yet to experience a dropout in live recording—and that's with 6 concerts under my belt. JGH

3 For a report on the Dennesen, see BS's report in Volume 7, Number 4.

monitor" column in *HFNRR* and try out his recommendations; I try the so-called audiophile cassettes again and again.

The hell with it. No matter how bad Compact Discs may be today, they are already better than even the best prerecorded cassettes. I agree with Angus McKenzie's conclusion that a few prerecorded cassettes approach records—but I feel he overrates them compared to the best records. Further, most of these cassettes are difficult to get in the U.S. and they are about as common as talking dogs even in Europe.

Most prerecorded cassettes simply don't hack it by the standards even of bad Compact Discs. Even the so called audiophile versions exhibit wildly differing equalization curves (or other amplitude variations), rotten overall consistency, and a reasonably high frequency of mechanical failure. Worst of all, the small group of sadists that try to enforce equalization standards, the IEC (Idiotic Equalization Committee), has just decided to play around with the upper frequencies in the curves again. The end result is a major difference between whatever standard is *au courant* and the upper-octave response of the best cassette decks (Tandberg and Nakamichi)—not to mention what the lesser decks do.

This equalization gamesmanship would be bad enough if it had only been done once and on a common basis, but I have yet to find two brands of prerecorded cassettes with the same high frequency balance, and about half the machines on the market do not fully conform to any of the equalization standards issued since the cassette hit the market anyway.

Look at how well the playback response curves published in *High Fidelity* and *Stereo Review* tests of cassette decks conform to any standard if you wonder about this statement. Machines with virtually flat playback response curves from their own tapes commonly exhibit 5 dB departures from the equalization standard.

Now, add a ±3 dB variation in most decks using dolby C, bass bumps and phase problems from head effects, and high frequency rolloff of up to 15 dB at 0 VU, distinct wow and flutter or long term speed stability problems in the prerecorded tape and/or playback machine, and tape jitter at high frequencies. For once this is not a golden ears versus engineer debate. Prerecorded cassettes not only don't approach discs in quality, they can be proven inadequate using (wow! whoopee!) *measurements*.

This does not mean that prerecorded cassettes are not fun for making musical noises while driving, jogging, airplaning, grape tromping, etc. Stripping away the hype, standard Maxell and TDK tapes can be used to make one hell of a nice cassette from your records or FM. And you don't need metal or chrome equivalent (Type II) tapes.

If you use a halfway decent machine and the better "regular" Maxell and TDK tape, the cassettes will be adequate. Car and personal players don't set particularly good equalization standards. Even then, who cares? With 40-60 dB of background noise, it just doesn't matter.

This means, however, that the principle function of a high end cassette deck will be copying for the car, or recording records and broadcasts. I have already discussed the merits of archiving, and you have to decide for yourself. I will note, however, that cassette tapes are cheaper than either open reel or video tapes (only slightly in the case of the latter) and cheaper than records.

The best Maxell iron-oxide cassettes usually outperform the Chromes and Metals in terms of midrange transparency. The latitude and retentiveness of metal tape is necessary in the highs for serious recording purposes, but only the most expensive metal tape—Maxell's and Nakamichi's—have low grain.

RANKING SOME CURRENT CASSETTE DECKS

If I sound jaundiced, it's because I've spent the last six months comparing high end cassette decks. The results can be summarized quickly: Nakamichi and Tandberg make top of the line units; they approach but don't equal the best open reel decks and Beta HiFi.

The Nakamichi ZX-7,[4] the Nakamichi Dragon, and the Tandberg 3014 are all very good units, as will be described shortly. Unfortunately, I did not find any medium priced cassette deck I can confidently recommend above the others. Most didn't even get to the review stage. The Sony TC-FX1010 I borrowed behaved like a Jacques Tati joke about technology triumphing over sound. A Teac with a control panel somewhat more complex than a nuclear submarine has been wiped from my memory to the point where I can't be sure of the model number. A brief listen to the Technics M-95 revealed serious problems with the upper octaves and a hard transistory sound.

Worse, I did find a cheap good cassette player, but it did not prove reliable and hence no "best buy" rating. But, enough preliminaries. Let's take a closer look at what cassette machines can do.

TANDBERG 3014 (Serial Number: 652-00044. Price: $1,395)

Another step forward in a major sonic comeback for Tandberg. If you got burned by the 340A or 440A cassette decks, well, no one is perfect. Tandberg is really on the march in improving the sound quality of its product line.

Forget about past criticisms of Tandberg's erratic mechanical drive and the annoying wow and flutter characteristic of the 340 and 440 series. The speed of the 3014 is close to rock steady; the variations are less audible than the speed changes in many turntables. Forget about past hum problems: the unit is fine. Remember the electronics, which were Tandberg's strong point: these are excellent in the 3014, and the audio stage has the best midrange I have heard in a cassette deck.

The 3014 is consistently musical in recording and playing back a wide range of music. It preserves the soundstage, imaging, and depth. You will get 85% of the midrange quality of even the best record and 95% of any FM broadcast. This is outstanding for *any* home recording device. You also get a real-time tape counter, 3 heads, 4 motors, and eighteen knobs and push buttons. The 3014 has Dolby C, a headphone amplifier, variable record sensitivity, moderately visible VU meters, and a pretentious little EPROM microprocessor that fortunately is not given synthesized speech, but does seem to do a good job of adjusting to given tapes. The 3014 has adjustable azimuth—an absolute must for a high end cassette deck. No cassette deck is really worth more than $500-700 that does not allow easy azimuth calibration for each tape to ensure maximum highs and compatibility with other machines.

The Tandberg 3014 does have some sonic faults. It is solidly excelled by the Nakamichis in the upper octaves. The Nakamichis have more HF extension, more stability, and more air in the upper three octaves (for the Dragon) and the upper two for the ZX-7. You'll have to listen to music on these machines to hear this, since steady-state measurements of tape decks simply don't correlate with what you hear).

The Naks also have more apparent high frequency headroom as you approach 0 VU. The Tandberg may have all sorts of special circuitry to deal with the upper octave but it seems to work best on sine waves. The Dragon is significantly superior in dealing with upper octave musical content.

Even on a scope, the upper frequencies on the Dragon (which automatically and continuously corrects for azimuth) are much more stable. On a ribbon or electrostatic speaker, the difference sounds like two additional octaves of stable, natural sound!

I will get to the subject of noise reduction when I talk about the Beogram 9000, but the Tandberg does a damn good job with Dolby C if you are recording and playind back tapes made on the Tandberg. In that sense it's like every other good cassette machine. It does very well on tapes made on itself but less well with prerecorded tapes or tapes made on other machines.

4 The ZX-7 is no longer imported to this country; the slightly more expensive and better ZX-9 will have to do.

If you use Maxell metal tape the Tandberg 3014 will come within an ace of Beta HiFi in every aspect other than the two bottom octaves and the two upper octaves. It is definitely still in the audiophile class in the bass and (oddly enough) superior to the Tandberg 20ASE in the low bass if you select the right cassetes. It even does respectably well on regular Maxell tape, providing good midrange at the cost of poorer highs.

The Tandberg 3014 joins the Nakamichi ZXL and Dragon in outperforming many open reel tape recorders, and certainly the stock Revoxes. In fact, I prefer all three of the above cassette decks to open reel tape recorders at 7 ips, quarter track. The top cassette decks sound more stable, they have a more solid and less transistory midrange, and they eliminate hiss far better—which simply sounds awful on today's better ribbon and electrostatic speakers. In short, three cheers for Tandberg. A stunning comeback from the mediocrity of previous models.

THE NAKAMICHI DRAGON (Serial Number A-801 0332; Price $1,850)

The Dragon's most import feature is automatic and *continuous* azimuth correction. This is not just a clever gimmick; it gives the Dragon's upper two octaves a solidity that surpasses even the Tandberg 20ASE open reel half track at 7 ips.

It also means that the Dragon can correct for the variations in azimuth on prerecorded tapes and tapes made on other machines. This makes the Dragon the *only* deck (if you've got the dough) for anyone who already has a large collection of prerecorded cassettes. Even the best cassette tapes vary in azimuth as the tape unspools, so no fixed azimuth setting will be correct through the duration of the tape.

The Dragon also seems to minimize low bass irregularities as well as phase and amplitude jitter in cassettes. It has smoother deep bass than the Tandberg 3014 and is by far the most solid-sounding cassette deck in the upper frequencies. There is still significant phase and frequency response variation over time as the tape moves relative to the tape head, but less than with any of the competition.

Further, the Dragon has an excellent automatic reverse, and a nice auto-halt feature if you are recording records. When the record stops, so will the Dragon. Other features are good meters and easy tape set up. I *would* like a time counter reading in minutes and seconds rather than the conventional tape counter, and I found the bias adjustment on metal tape to be a bit uncertain with brands other than Nakamichi, but all in all, I was impressed.

How does it compare to the Tandberg? Well, the Dragon is superior at the frequency extremes and the Tandberg in the midrange. Call it a dead heat, except for the Dragon's superiority with "foreign" tapes.

THE NAKAMICHI ZX-7 (Serial Number 06072; Price $1,250)

This unit may be slightly more stable in speed and pitch than either the Dragon or Tandberg, but it lacks the Dragon's automatic reverse and azimuth correction and the Tandberg 3014's midrange clarity and superior audio stage. Still, a truly excellent machine. Another dead heat in terms of value for money, but the 3014 and Dragon sound slightly better.

THE BEOCORD 9000 (Type 4813; Serial number 2617001; Price $1,800)

This is a beautiful job of human engineering. Anyone who reads the instruction booklet can get very good recordings almost without trying, and the midrange quality is superior to the Nakamichi's and rivals the Tandberg. It has excellent automatic tape calibration, the counter is calibrated in minutes, and end-of-tape features that should be standard in the industry.

The Beogram 9000 performs well with ordinary tape, and is ideal for anyone who wants to learn nothing about recording and still make good copies of a record or off the air. You also will learn how to operate a mini-computer by the time you learn every optional feature.

The Beogram 9000 is a two-head machine, which means it lacks an off-the-tape monitoring capability, although I find this feature to have little value in practice. A monitor head on a cassette machine will tell you that the record circuit is working but very little about what the tape will sound like when it is rewound and replayed. Even on the best machines, it will fail to tell you if there is anything mechanically wrong with the cassette you are using unless it actually jams, and the Dragon is the only machine that will repeat the playback azimuth well enough so you can be sure of the top octave azimuth alignment after several windings and re-windings.

A significant disadvantage of the two-head design is that the playback and record heads cannot be designed for optimum performance; it also seems to restrict high frequency range. It rules out easy azimuth adjustment and adjustment for each separate tape recorded; since there is no consistency of tape even within the same brand and type, this is a critical defect.

The 9000's main problems lie in the highs, although they are passive problems rather than the irritating active ones. There is considerable high- frequency jitter, and tape-to-head contact is not all that great. The result is a warm sound with reduced imaging stability.

I cannot fault the speed regulation, but the design uses a very complex drive system which makes me suspect problems over the long term, though I had no problems with it.

The Beogram's mix of Dolby C and HX Professional is perhaps the best quieting system of all the units tested. This judgement, however, is personal; forget about simple S/N measurements. What matters is the character of the noise (where it lies in the frequency spectrum), and changes of frequency response with level change.

Whatever the theoretical merits of HX Pro and Dolby C, the execution varies sharply. So far, I am much happier with the consistency of Dolby C than HX or HX Pro, and I suggest you treat HX as an add-on of possible value, but focus on the sound with Dolby C. By comparison, Dolby B is just not effective enough. Any machine lacking Dolby C must be seen as a questionable value.

There is considerable variation in the sound of Dolby B and C on the same brand of cheaper cassette machine. The Dolby B may track well while the Dolby C may not, even on the same machine.

This means you either must buy one of the better and more expensive machines or listen to the specific sample you intend to buy. You can do a quick check with FM interstation noise and then a record with clear pronounced highs. A decent Dolby system should not alter the frequency balance, although some changes in transient detail and hiss levels are inevitable.

The Beocord 9000 is a good deck if you want its computerized features and don't really want to have to learn how to operate and set your machine. Otherwise it's no competition for the Dragon, ZX-7, or Tandberg 3014 in overall sound quality, and the 9000's $1800 price tag makes it prohibitive. Even at $1250 I wouldn't recommend it over the other three.

THE REVOX B-710 II (Type 10002; Serial number 16709; Price $1,995)

The transport in this unit is superb and it's built like a battleship and measures well, except for the high frequencies. Unfortunately, the rest of the Revox's performance didn't prove out. The B- 710 II costs $2,000 and does not match the Tandberg in terms of midrange clarity, nor approach the Dragon in high frequency performance. All in all, the $1,250 Nakamichi ZX-7 outperforms the Revox in the midrange (barely), in the bass (moderately), and in the treble (a lot).

Like the B&O, the Revox is a high end cassette deck without easily adjustable azimuth. Further, bias settings are internal with no convenient access. I have found that correct bias, like azimuth, varies within the same brand and type of tape. This lack of features is, in my book, unacceptable considering the price of this unit, and its pretensions to high end status.

THE AIWA AD-F990H (Serial Number D3041408; Price $595)

If this unit had worked out of the box, and if my local dealer hadn't informed me that they frequently *don't* work out of the box, this would be the "best buy." In spite of the fact that it looks like the control panel of a video arcade space game, the Aiwa combines good audio stages with about 75% of what you get from the Nakamichi ZX-7.

You get Dolby C, HX Pro, automatic tape setting, and automatic head demagnetizing, and an incomparably awful set of *bedienungsanleitung* (which is German for operating instructions). It doesn't matter, because the Aiwa virtually operates itself: it offers a search mode for the quiet spaces between songs or movements, it sets itself to the noise reduction mode if needed, automatic replay, shows tape time remaining, and can deprogram your children of the Judeo-Christian ethic.

It also has some good sonic qualities. The speed stability on two of my three samples was excellent, the sound was a bit hard and transistory but much less so than the best Sonys and Teacs I've heard, and less so than good-to-ordinary units like the Denon. Azimuth adjustment is not possible and there was high frequency jitter, but the highs were all right. Bass response differed slightly between the three samples I tried, but this is par for machines under $1000.

The bass was warm and slightly blurred, but most cassette machines *do* give you more bass than you pay for. Look for a low-end rise on the tests in the glossy mags. They translate into jukebox bass on more cassette decks than not.

So why not a "best buy" rating? Well the unit the manufacturer sent simply would not open to admit a cassette. Bad! The unit is way off from the standard playback equalization curve, and rolls off the highs. Bad! There was a significant difference in left- and right-channel frequency response. Bad!

Before you jump on Aiwa, however, let me point out that while their reputation may not be perfect, Aiwa is definitely regarded as one of the better manufacturers of moderately priced units, most of which are far worse than this one.

YAMAHA K-2000 (Serial Number 01798; Price $795)

This unit provides good sound quality. Dealers also praise the reliability. A pity, however, that Yamaha opted for dbx.

This dbx is better than on the Teacs I have heard, but the bloody thing still pumps. So do the latest dbx separate units, and I have the impression that a grain is being added over a wide frequency spectrum along with the pumping. This may explain why I have heard so few other high end audiophiles praise consumer-level dbx devices. The Yamaha has the best dbx I have heard, but I would still approach any such unit with caution.

CONCLUSION

So concludes my ideas on how to have a grand time with your grand. Unfortunately, the grandest times require far more. Depending on what you own already, my best advice for easy, enjoyable sound is to upgrade your analog record player. In second place is probably a Beta HiFi recorder, particularly if you don't already own a VCR. It's something new, it's not hard to use, the fidelity is quite good, and you'll have a good time.

Those of you who can appreciate the advantages of PCM recorders and analog reel-to-reel machines are probably already using one or the other. Compact Disc is, in my opinion, still in its infancy. Though I've tried many of the players and almost a hundred of the discs, the results are so variable that it's hard to make a recommendation. The best CDs have real advantages over analog in some respects, but overall my recommendation is to wait. You have little to lose, and if people wait long enough the industry may well come up with some superior discs and players.

It's clear what cassette players are good for. FM tuners similarly meet a very specific need; if you have a station that's worth listening to, a good tuner (and I'm told there are some reviews upcoming in this mag) is definitely a good way to spend part of your grand.

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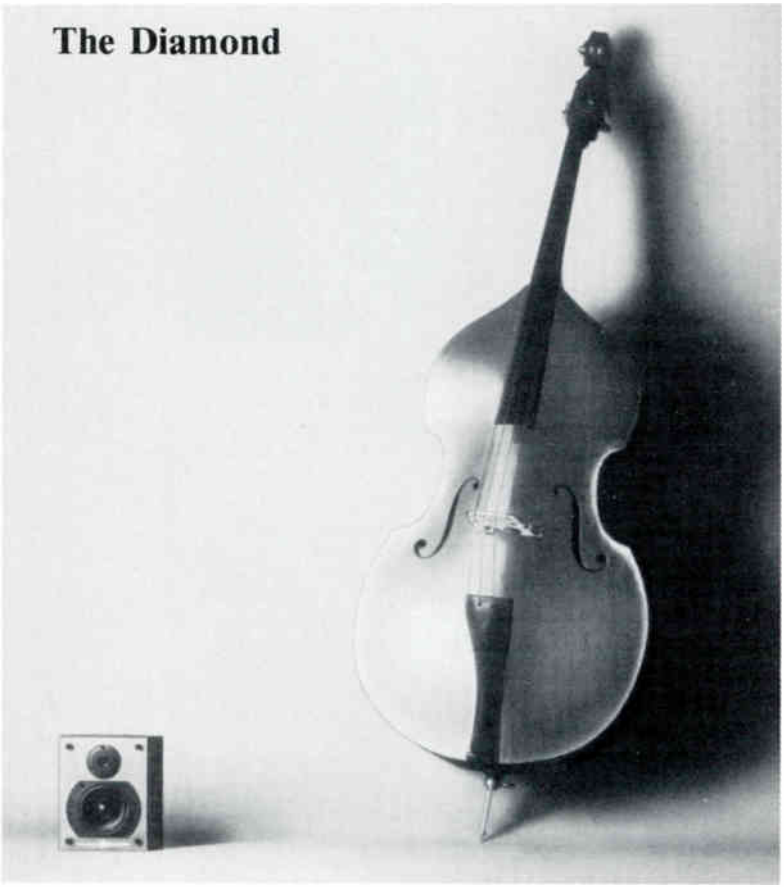

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COMPACT DISC

HANDEL:
The Messiah
Margaret Marshall, soprano; Cathrine Robbin, mezzo-soprano; Charles Brett, countertenor; Anthony Rolfe-Johnson, tenor; Robert Hale, bass; Saul Quirke, boy soprano; Monteverdi Choir; English Baroque Soloists, John Eliot Gardiner conducting.Philips Compact Disc 411041-2 (3 discs)

Amazing as it may seem, this is one of three "original-instrument" performances of the *Messiah* currently available (the other two being the Hogwood on L'Oiseau-Lyre and the Harnoncourt on Teldec). To the best of my knowledge this one is the first to be released in its complete form on CD. For this performance Gardiner has not attempted to reproduce any of the several of Handel's own versions of the work, but instead has chosen principally from Handel's London performances of the 1750's.[1] The result of Gardiner's and Philips' efforts can be summarized in one word: "BRAVO!" This is a first-rate performance in all respects, and also an excellent recording.

It was made with the orchestra and chorus in semicircular configurations facing each other. Through the wonders of modern electronics Philips creates a convincing illusion that the orchestra is in front of the choir, and an excellent sense of depth. But there are a few slips; occasionally the soloists sound as if they're sitting on the harpsichord, and in a few instances (most notably the final Amen) the illusion or realism breaks down completely. These problems are so infrequent as to be only a minor distraction.

Inner detail is superb, yielding clear separation of the individual voices. Gardiner is to be congratulated on the choir's clean enunciation. Yes, you can actually understand what they're saying without following the libretto.

Dynamic range and contrast also are of the highest order, allowing the sense of drama and fervor which are an essential part of this excellent performance to be reproduced convincingly in the home. The only real deficiency is a shortage of ambience; it is difficult to tell much about the recording hall. Still, this is highly recommended both for performance and recording. **SWW**

1 For an excellent treatment of the variations in the different original-instrument versions of the *Messiah*, I refer the reader to James Miller's review of the black vinyl version of this recording in the January/February 1984 issue of *Fanfare*.

COPLAND
Appalachian Spring Rodeo;
Fanfare for the Common Man
Atlanta Symphony Orchestra, Louis Lane conductingTelarc CD-80078

Perhaps it's a tribute to Telarc's ability to produce analog records, but I found this CD release to sound pretty much the same as its black vinyl counterpart; that is, a fine performance very well recorded. Except for the absence of surface noise on the CD, the sound of the CD and LP is quite close. Dynamics, tonal balance, ambience, perspective and depth of image between the LP and CD vary only slightly and are quite good on both versions. The CD seemed to have a somewhat more stable and precisely defined horizontal image, but at the cost of a narrower soundstage. I suspect the CD version may have better centerfill, which produces the impression of less width of image. The CD also seemed more detailed and transparent at higher levels, but not as clear on low level passages. Some of the woodwind solos on the *Rodeo* selections sounded better on the LP, but the high level brass passages were more convincing on the CD.

Lane's delicate and subtle interpretation of *Appalachian Spring* is my favorite full orchestra performance of this work, although I suspect most will prefer Copland's own version for its definitiveness or Bernstein's for its familiarity and dramatics. Lane's performance offers an interesting contrast which aficionados of this work should find most enjoyable. **SWW**

BACH, J.S.
Toccata & Fugue in D Minor; Concerto No. 2 in a Minor; Prelude & Fugue in B Minor
Prelude & Fugue in D
Michael Murray on the organs at First Congregational Church, Los AngelesTelarc CD-80088

Michael Murray is a virtuoso organist and this marks his twelfth recording for Telarc.

Therefore, I find it no surprise that he has finally recorded the Toccata & Fugue in D Minor in digital format.[1] There are countless recordings of these famous Bach organ works, and any attempt to designate a "best" or "favorite" would be a hopeless task. Murray's renditions certainly are first rate, but tend to be a bit too much on the romantic side for my tastes. Still, they are fine examples of a master organist employing his craft, and I found them most enjoyable. The same can be said for the organs at First Congregational Church, which certainly must be ranked as among the best.

Telarc's recording, as usual, is superb. There are the expected sonic fireworks, with huge dynamic range and awesome bass. The 32-foot pipes are captured with all their sonic force, which is where all too many audiophile organ recordings end. Robert Woods, the producer and recording engineer, has done an exemplary job of also capturing the subtle harmonic contrasts and timbral distinctions of the various ranks and pipes on this magnificent organ. The only flaw in the recording is that the ambience of this neogothic church are not fully conveyed. Still, an excellent recording and fine performances. **SWW**

PROKOFIEV
Romeo & Juliet—
Excerpts from Suites 1 and 2
The Cleveland Orchestra, Yoel Levi conductingTelarc CD-80089

Just when I thought I'd got Telarc's sound down pat, they changed it on me. The sonic characteristics of this recording represent a distinct departure from Telarc's past offerings; I believe it reflects Telarc's coming of age as a significant record company. Gone are the emphases on sonic fireworks and the conductor's ear-view of the orchestra. What we have here is an excellent recording, with natural perspective, of a large symphony-orchestra. Hall accoustics and ambience are remarkably lifelike, timbres and dynamic balances are correct, and width and depth of image are very good. Even the upper register strings seem smooth and natural—no digitalis here. This is the most natural sounding recording of an orchestral work I've heard from Telarc. Consequently, unlike many prior Telarc releases, I don't expect it to frequently be employed in dealers' showrooms.

Yoel Levi elicits a technically fine performance from the Cleveland forces, and distinguishes himself as an up-and-coming young conductor. But though Levi cannot be faulted on technical merit, both the selections and the interpretations tend to emphasize the romantic and lyrical aspect of the suites at the expense of the dramatic and modern. There are several other performances of this work I prefer, including (in CD format) Solti's recent release on the London label. Even so, this one from Telarc can still be recommended as a wonderfully natural recording, especially for those inclined towards the romantic aspects of these works. **SWW**

SHOSTAKOVITCH
Symphony No. 5, Op. 47.
Concertgebouw Orchestra, Bernard Haitink conducting.London CD 410-017-2

This is a so-so recording. Instrumental balances are good most of the time, the instruments stay put (instead of popping out from different spots on the soundstage), and all the instruments are recognizable by their timbres. But the sound has some of that steely brightness which has typified so many Londons in recent years. Then there's the artificial reverb, which is laid on so heavily in places that it sounds as if the orchestra is playing in a vacant cathedral. The steely brightness is right on the edge of things; it will sound okay on systems that are a little shy of brightness, and pretty bad on ones that are a little too bright to begin with.

Haitink's reading is a bit too laid-back, and just never generates the tension and the electricity necessary for a memorable rendition of this symphony. It's an acceptable approach to the music, but it does not make for as harrowing a listening experience as this work can and should be. The best recorded performance I have ever heard was on an antique mono LP with Artur Rodzinski and the London "Philharmonic Symphony" (Westminster XWN-18001). If you can find a copy of the Rodzinski, buy it. *That* is the way this music should be played. Mono or not, and despite a sizzly high end and mike-preamp overload on one loud trumpet passage, the recording is a hair-raiser even by today's standards.

If you want this music on CD you have a rough choice. Bernstein's version on CBS is a much more exciting performance but the recording is a mess! Haitink's is a better recording but a less exciting reading. My advice: wait for a good recording, or listen to analog. **JGH**

1 A previous analog recording of this work by Murray on Telarc has been deleted for several years.

DIGITAL MASTERPIECE SERIES, DISC 2
Selections from Ginastera, Debussy, Tchaikovsky, Rimsky-Korsakov.

DIGITAL MASTERPIECE SERIES, DISC 3.
Selections from Handel, Bach, Pachebel, Smetana, Tchaikovsky.
Philharmonia Hungarica conducted by Zoltan Rozsnyai. M&K RealTime RT-2003 and RT-2004, Compact Discs.

At the risk of being even more tedious than usual, I am forced by the evidence of these two Compact Discs to reiterate what has become my biggest gripe about recordings for the past 20 years: the better the recording quality, the worse the performance. The reverse holds equally true. Not always, just 90% of the time.

After having auditioned a good 40 or so symphonic CDs, I am forced to revise upward my estimation of M&K's Digital Masterpiece series. I am no more enthusiastic about the performances, which are competent but uninspired. I'm not any happier with RealTime's pickup of the bass drum, which is powerful but sodden. But after having clawed my way through the offerings of London, Deutsche-Grammophon, RCA, Philips, Argo, and Erato, I must report that RealTime has produced more good-sounding orchestral CDs than almost anyone else to date.

I am aware of the economic and contractual considerations which prevent a small, perfectionist-oriented (read "poverty-stricken") record company from recording a first-string conductor and orchestra, and the unfathomable corporate thinking which seems to prevent a large, largessed record company from doing anything in a forthright, hands-off manner. But knowledge does not prevent me from getting boiling mad when I think of the thousands of botched opportunities for producing superb recordings of superb performances during the past quarter century.

It's not that Zoltan Rozsnyai and the Philharmonia Hungarica are bad, as conductors and orchestras go. In fact they are better than most. It is just that by comparison with most *recording* orchestras, they sound embarrassingly lacking in suavity and polish. And when a recording is this good, it just seems wasted on anything less than superb performances.

Here, for the first time on CD, are clean, unstrained crescendos from the whole violin section, perspectives resembling those heard from a good seat in the house, and a reasonable balance between direct instrumental sounds and hall reverb. Here is stable imaging, superb front-to-back depth, and the kind of unstrained full-orchestra sound that CD has always promised but is only now beginning to deliver. Here, in short, is evidence that CD can reproduce massed violin sound properly.

My advice: If you own a CD player and want a taste of what it can do with orchestral sound, buy at least one of these M&K discs and bask in the effulgence of reproduced sound the likes of which you may never have heard before. And play one for a friend who still believes analog is king. **JGH**

MAHLER:
Symphony No. 8 ("The Resurrection")
Arrangement: Arthur J. Bishop.
Trinity Ancient Instruments Ensemble conducted by Tavi Glith.AHTSI 6-021.

Probably one of the most daring, or should I say audacious, musical innovators of the last 25 years has been Arthur Bishop, whose latest assault on musical taste is this reduction of the massive Mahler 8th Symphony to a trivial chamber work.

Bishop has had a reputation for musical newthink ever since his arrangement of Tchaikovsky's *1812 Overture* for three kazoos, which premiered in 1958. His performed but as-yet-unpublished "Goldberg Variations" for orchestra, chorus and three soloists earned him widespread critical calumny. As one reviewer of the *1812* premiere put it, "Bishop gets to the very root of this music, and takes an 'o' from it."

With this *Resurrection* symphony, Bishop appears digitally for the first time. Recorded on the Sonex GDGAD-101[1] system, the disc is incredibly faithful to the sound of the instruments.

How does Mahler fare with six ancient instruments? He loses. Had I not a prior understanding of how much it costs to make a recording as good as this, I would have thought it was someone's perverted idea of a joke. Relegating all the choral parts of this monumental work to a single instrument—the sackbut, which sounds like a bassoon with sinus blockage—is bad enough, but to ask several of the other instruments, most of which are impossible to play anyway, to carry three melodic lines apiece by alternating between them as rapidly as possible, is ridiculous.

This is really an unmitigated disaster, a recording that historians will someday list in the company of Pompeii, Pearl Harbor, and the Amplified Guitar. **JGH**

1 Gosh-Darned Good Although Digital.

SAINT-SAENS:
Piano Concerto No. 2.

RACHMANINOFF:
Rhapsody on a Theme of Paganini.
Bella Davidovitch and the Concertgebouw Orchestra conducted by Neeme Jarvi. Philips CD 410-052-2

At last we're starting to realize some of the promise of CD from a major record company. This is the best CD recording I've heard yet from Philips. Both of these are virtuoso romantic works requiring a *big* piano sound and the stamina to produce it for 6 to 10 minutes at a stretch, which is probably why few lady pianists will tackle them. Bella Davidovich pulls these off with great aplomb.

To me the Saint-Saens is the better of the two, and is one of the truly great performances of this work. I grudgingly rate it as equal to my long-time favorite, the Rubinstein/Reiner performance on a 1958 RCA (LSC-2234), although I would have liked a little more TLC from Ms. Davidovitch in the first movement. She seems a little rushed where an occasional lingering caress is indicated, but that is quibbling with what is a really rousing performance.

Most of the Rachmaninoff is superb too; I suppose the only reason I felt parts of it to be too fast is my abiding fondness for the old Katchen/Boult version on London (originally CS-6153, reissued as STS-15406).

But that's not all. This, the first digitally mastered Philips CD I have heard, is also the best-sounding Philips CD I have heard. Multimiked of course, with the usual lack of depth and weird instrumental placements (flute on the far left), this is nonetheless one of the most high-powered recordings I've ever heard from a non-audiophile label. The dynamic range sounds positively staggering, yet measurements comparing it with the analog-disc release showed their average (RMS) volume range to be exactly the same. And the loudest parts on the CD are as effortless as only a digital fortissimo can be.

There's more. Instrumental balances are perfect (the piano does not dominate), there is no steely hardness, and even the first violins playing full-out sound reasonably like massed violins. In short, this is but the second orchestral disc I have heard from a major company whose sound could help to justify the purchase of a CD player. (The other is the Stravinsky/Dorati *Le Sacre du Printemps* on London).

There are some problems. The sound during full orchestral passages is vaguely muddy, and there are subtle little fuzzies underlying the massed-string sonorities. These things, along with the noticeably reduced steeliness as compared with previous Philips releases makes me wonder if this recording might not have been worked over a little between the original digital master and the CD transfer. Since there is not yet any such thing as a digital equalizer, such "adjusting" would have to be done with the signal in analog form, which means two additional conversion steps: from D to A and then A to D again.

My own personal feeling is that a little mud is preferable to a little stridency, so I would still rate a recording with these rousing performances as a surefire winner. It is one of the few performances I've heard on CD during which I could not stay seated; I had to pace back and forth waving my arms. The endings just cry out for thunderous applause, and even though I know it would be cheating, I wish Philips had added it. If you have a CD player, you *must* get this; otherwise, get the analog version. It's a humdinger! Unquestionably T-O-P! **JGH**

TCHAIKOVSKY
SWAN LAKE SUITE AND NUTCRACKER (SUITE NO. 1).
Israel Philharmonic Orchestra conducted by Zubin Mehta. London CD 410-551-2.

Now here's a London CD I can recommend! Yes, it's multimiked, all the instruments sound a bit too close, it lacks depth, instrumental placements are a little odd, but the sound is nonetheless stunning. There is virtually none of the typical London steeliness; the sound is rich, full and awesomely clean, with rousing brasses, deep, taut bass and incredible inner detailing.

And for a change, the performances are delightful. This is lyrical, melodic, *fun* music from two of the most popular ballets in the classical repertoire. Mehta's *Nutcracker* is not quite as winsome as Dorati's performance (Philips 730-078-8), but is still one of the best I've encountered. Very highly recommended and, probably, Top-of-the-Pile.[1] **JGH**

1 For the benefit of new readers, "Top-of-the-Pile" designates a very good recording of a very good performance—a recommended recording. The name reflects the fact that, at least among people who pile their records, the ones the most often played are nearest the top.

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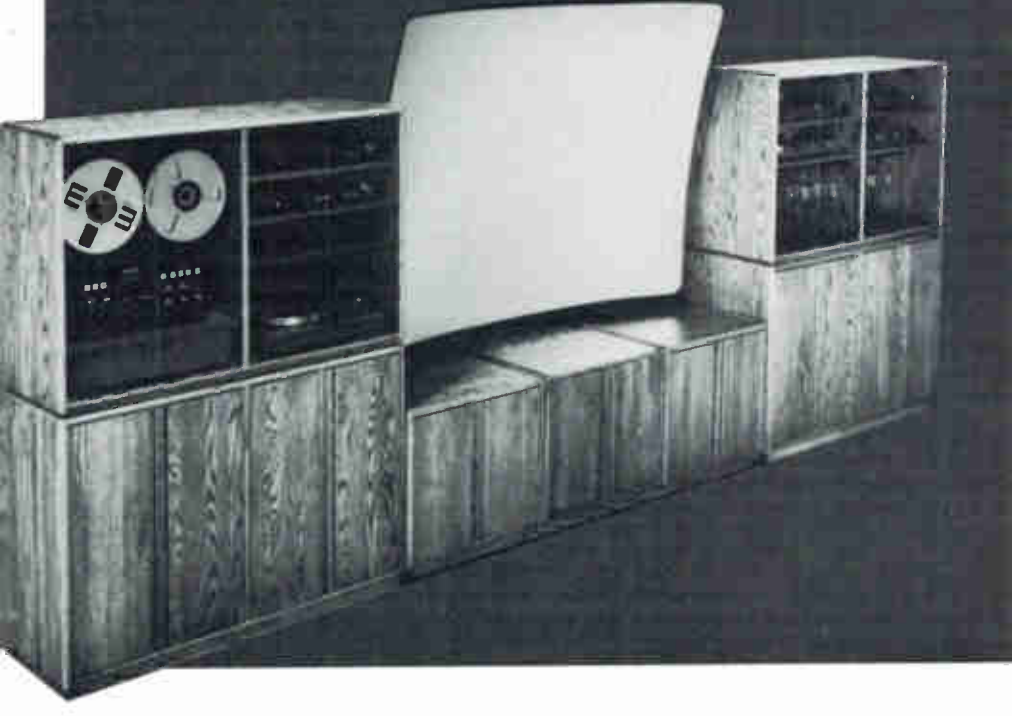

SAINT-SAENS
Piano Concerto No. 2.
RACHMANINOFF
Rhapsody on a Theme of Paganini.
Bella Davidovitch, Concertgebouw Orchestra conducted by Neeme Jarvi. Philips 6514-164.

These two popular but not-often-played romantic works for piano and orchestra are stunningly performed (see the review of the Compact Disc elsewhere in this department) and almost equally well recorded. Most of the comments about the CD apply here, with several important differences. The CD seemed to have slightly more extreme high end and notably better transient attacks, as well as better inner detailing, tighter and better-defined bass, cleaner fortissimos, and, of course, much lower background noise (though our analog disc was an unusually quiet pressing). The massed-violin sound on the analog version sounded sweeter than the CD but was missing some of the gutty edge I hear from the violin section at concerts. And for reasons not yet fully understood, the CD sounded as if it had substantially more dynamic range than the analog disc, although measurements failed to confirm that impression.

If you don't have a CD player, the analog disc is highly recommended. Both are now on our "Top-of-the-Pile" list. **JGH**

THE HUMAN HOLIDAY
Christopher Hastings, John Wilson, Ted Hlavac, with special processing by Keith O. Johnson.
A&R Records AR-1001.

What do you get when you cross the mordant wit of a Douglas Adams ("The Hitchhiker's Guide to the Galaxy") with the dubious taste of "Monty Python's Flying Circus"? You get *The Human Holiday*, that's what.

The premise of this highly imaginative skit is a sales pitch, by The Finite Corporation, touting as the ideal vacation for bored, restless souls an incarnation as a human being. Seven holiday packages are offered, ranging in length from "Infant Magic" (starting with nine months in your own private womb and terminating in an unexpected premature death at 2) to "Senile Adventure" ("Good morning, Mr. Parsons; did you have a nice BM?").

Although the main voices are very closely miked, the sound is so good you simply forget about it after a few minutes and become completely immersed in the content. (Reference Recordings' Keith Johnson did the special effects and the Mastering Lab did the disc cutting.) But after you've heard it superficially a few times (the upper layers, that is), you begin to notice that there is a lot going on underneath—comments, conversations, pertinent sounds---that will take many rehearings to dig out. This is in fact a recording that will make you more painfully aware of resolving limitations in your system than any symphonic recordings; to separate the underlying levels of sound from the surface requires inner detailing that few systems possess.

The Human Holiday is so slickly and convincingly done that one finds it easy to accept the whole thing as being real. In fact, so persuasive is its effect that it made me long for the days of drama on radio, where one's own imagination could set stages more vast or opulent or realistic than anything bound by the confines of a visual image. (Who remembers Stan Freberg's ice-cream mountain?) But the humor is not for everyone. There is in fact something about this that makes many listeners acutely uncomfortable, as though Dorothy had lifted the curtain and found, not the kindly old Wizard of Oz, but the Angel of Death. The Human Holiday has much to say about the Human Condition, and some things about the latter will not amuse a lot of people. But if you can laugh off another uninvited wrinkle or the idea that your own life might in fact just be a brief divertissement for a visiting spirit, you'll delight in this rare aural entertainment. It's a masterpiece! **JGH**

JOHN WILLIAMS
The Star Wars Trilogy. Suites from "Star Wars," "The Empire Strikes Back" and "Return of the Jedi."
Utah Symphony Orchestra, Varujan Kojian conducting. Varese-Sarabande 704.210

After having heard Zubin Mehta and Charles Gerhardt tackle John Williams filmscores in the past, I was prepared to say that only the composer really understood how his music should be played. I recant.

Kojian's performances on this disc are the equal of Williams,' and this Varese-Sarabande recording is much, much better than anything Williams has been handed for his own performances.

These three orchestral suites from the "Star Wars" saga were arranged by John Williams, and include some sections that were not on any of the original-soundtrack albums. And while JW's music is sill more effective as ac-

companiment for the films, it stands very well on its own merits. The album is delightful to listen to whether or not you ever saw the films. (Although I would think odd things about anybody I met who *hadn't* seen any of the films by now.)

By all means, get this! It's a system showoff as well as a musical extravaganza. **JGH**

SIBELIUS:
Symphony No. 3 in C, Op. 52; Suite from "King Christian."
Gothenburg Symphony Orchestra, Neeme Jarvi conducting.BIS DMM LP-228.This the first large-scale symphonic release I have heard that was mastered on a Sony PCM-F1 system—the "semiprofessional" PCM recorder than many users have claimed to be sonically superior to Sony's professional PCM-1610 system.

This is a strange-sounding recording, for reasons which I blame more on the recording technique (or hall) than to the recording system. The recording perspective is too distant for my taste and the sound is dark and oddly lifeless, both of which do a great deal to strip the performance of much of the excitement it may originally have been able to generate. There is no deficiency of highs, which are in fact superb, but the entire middle range seems sucked out, backing everything off and emasculating the brasses, which are so essential to both of these works.

Because of the sound, I really found it hard to judge these performances. The orchestral playing was beyond reproach, and I felt Jarvi was doing everything right in terms of tempo and phrasing, but the overall impression was of restraint and a shortage of passion. The recording seemed to have little dynamic range, which observation was not entirely attributable to the muted sound. (Pulling up the middle range with an equalizer helped substantially, but not enough.) All in all, rather a disappointment. **JGH**

SEFEL RECORDS
BARTOK:
Kossuth, Op. 10; Four Pieces of Orchestra, Op. 12:
SEFD-5005.
Suite No. 1, Op. 3; Two Portraits, Op. 5:
SEFD-5006.
Suite No. 2, Op. 4; Two Pictures, Op. 10:
SEFD-5007.
The Miraculous Mandarin; Dance Suite:
SEFD-1008.
Concerto for Orchestra.
SEFD-5009
BRAHMS:
Symphony No. 4 in E Minor, Op. 98:
SEFD-5002.
TCHAIKOVSKY:
Romeo & Juliet;
Theme & Variations:
SEFD-5003.

A new record company which started out with a Toronto address and now operates out of Denver, Sefel records started out the way many record companies end up: doing original recordings of major symphony orchestras. Sefel has to date recorded the London and Budapest Symphony Orchestras, with a single conductor of whom I have never heard: Arpad Joo. (The closest I could come to the proper pronunciation of Joo is "Joe-euh," with the second syllable rhyming with "u" of "burr.")

A native of Budapest now living in the U.S., Joo (who looks like a benign Mephistopheles) is a discovery worth his weight in gold: a conductor who can make an orchestra stand up and bark!

The man is simply incredible! He gets an astonishing range of expression and sonority from these orchestras, from the most seductively lush, serene mood or the most exquisitely delicate pastorale to a level of searing intensity rarely heard anywhere these days except on John Williams soundtracks. His sense of the dramatic equals that of Lodia Records' Carlos Paita, but wheras Paita tends to push the slower sections a little bit, Joo can go from hackle-raising violence (as in Bartok's "Miraculous Mandarin") to langorous tranquility at the drop of a semiquaver.

I had long feared that conductors with this range of emotional span, and the ability to express it through an orchestra, were a thing of the distant past. But Joo is everything that Serge Koussevitsky, Sir Thomas Beecham, or William Furtwangler were. He is the consummately versatile conductor!

I received for review seven of Sefel's first nine releases, and there isn't a bum performance among them. The recordings, unfortunately, are something else altogether. They were produced and mixed by Brian Culverhouse, who did some of English EMI's best symphonic recordings through the years, which makes me all the more surprised at the sound of these. But first of all, the nice things. For once, we have symphonic recordings that are not too bloody distant sounding! These have much of the feeling to them of the best latter-day monophonic recordings, which is to say the apparent listening seat is Row H rather than first balcony.

They have a very nice but restrained sense of acoustical space, the instrumental balances are generally very good, and the low end is deep, full and very tight. Plucked basses have the kind of fulsome impact you hear in a good concert hall. And the dynamic range is very wide, showing little evidence of compression. On top of that, the surfaces on every pressing were immaculate.

But, being multi-miked, the recordings do not have the seductive depth and naturalness that it is possible to get with simpler miking.

One thing and one alone takes these out of consideration as high-fidelity recordings; they are all relentlessly shrill. I have never heard this on any of Culverhouse's EMI recordings, and am baffled as to why the man should suddenly be seized with the desire to out-CBS CBS. Rather than thinking he's taken leave of his sensibilities, I prefer to guess that someone at Sefel chose the wrong phono system to listen to their own recordings on, but that's only a feeble guess.

So, we have another illustration of Holt's First Law. Superb performances, bum recordings.

If this spurious brightness could be curbed in future recordings, and Culverhouse could be persuaded to lean a little more on his general-pickup stereo pair and less on the spotting mikes, he, Sefel, and Joo could produce the richest crop of definitive recordings the record industry has ever seen. But as far as these are concerned, the sound just flushes them right down the ol' loo. Pity! **JGH**

VIDEO FOR PERFECTIONISTS

Charles Deane

Publisher's Note: *Charles Deane is a product design consultant for a high-end audio component manufacturer, and a "serious" video hobbyist. His professional expertise is in the field of audio design fo home video systems.*

A few months ago, I discussed with JGH and LA the possibility of my writing a regular column for *Stereophile* about video. We all had some misgivings about this—many audiophiles view video as a menace to their first love—but we decided to give it a trial run because, like it or not, video and audio are becoming increasingly interrelated in home entertainment, and because audiophiles who enjoy viewing Hollywood films and live-concert recordings at home are missing a great deal of pleasure by not combining their interests into a single home-entertainment system.

My background includes more years than I care to count working in television broadcasting. I was employed by a major-market CBS affiliate which produced a substantial amount of local live programming. In fact, my station kept a small orchestra on the payroll until the early '70s! I had the reputation there as the resident audio nut, and consequently I was often assigned the audio mixing for our live-on-tape programming. (Live-on-tape means no editing. It also meant that if a midday talk show guest from the local Humane Society brought in a dog that disgraced itself on camera, the tape kept rolling, and the disgrace was broadcast. That is now called *camera verite.*) For the most part my job was routine, but occasionally our productions rose to what we felt was near-greatness. We never achieved "really great" because our performers were, at best, semi-stars.

Watching playbacks of some of those near-great epics, I was often amazed at the impact made be the combination of good audio *and* good video. The production control rooms were dimly lit and equipped with high-resolution Conrac color monitors and large Advent speakers, and the combination of razor-sharp, detailed pictures and unusually good sound carried an emotional impact and invited a degree of involvement that is never experienced by the person watching a TV. I often thought how great it would be if the average viewer could catch a glimpse of how good those signals were before they left the studio to become scrambled, fuzzed and filtered by the average low-resolution, low-fi TV set!

Since then, Hollywood too has discovered the tremendously heightened impact that great sound can give to visual images, but it was not until recently, with the advent of LaserVision discs and Beta HiFi (from cassettes) that these could be seen and heard in the home with anything approaching TV control room (let alone movie theater) quality. This column will address itself to the audiophile whose pursuit of perfection extends to the visual as well as the audible in home entertainment.

Although most people equate video with TV, they are not really the same thing. Strictly speaking, TV is what you get off the air, whether from a nearby TV station or from a cable service that redistributes the same programs. Video encompasses *everything* you can view on a TV screen, directly or by projection onto the wall, whether the program be commercial (and commercial-ridden) TV or the latest Ingmar Bergman film, an

illustrated primer on how to grow petunias, a home-computer adaptation of a video arcade game, or Jane Fonda's Workout Program. Thus, while TV may be a total turnoff for a lot of people, video's potential appeal is to anyone who enjoys visual as well as audible pleasures.

Before it became known as "audio," the pursuit of better sound reproduction used to be called "high fidelity." The name change has not affected the nature of the beast, which continues to be pursuit of better—that is, morerealistic—sound reproduction than we now have. In order to sympathize with this, an audiophile must have a certain amount of idealism in his soul. Knowing that perfection is not attainable, he still feels it's worth striving for. To him, the actual fidelity of an audio system is of less importance than the pursuit of improvements.

The video perfectionist is rocking in the same boat. Although video picture quality lags far behind audio, and its perfection is probably no more attainable, the pursuit of a better picture is no less enjoyable or rewarding for him than is the audiophile's pursuit of better sound. But the videophile has an advantage over the "serious" audiophile. As of now, he is likely to be much farther away from perfection, and can expect to see far greater advances in the state of the art than can the audiophile

Many videophiles are driven by exactly the same Furies which motivate the audiophile. They are basically the same kind of people: perfectionists. Increasingly, the audio and video perfectionists are finding common ground and common cause. This department in the magazine will be devoted to those who came to that commonality from audio, and have realized that better images can enhance better sound. A million years ago, our ears and our eyes worked together to enhance our chances of survival. Today, they can do the same to heighten our enjoyment of recorded entertainment in the home. And that's what this new department is all about.

CD

RECOMMENDED COMPONENTS

Components listed here are the ones which our reviewers have found to be among the best available in each of four quality classes, based on all of the information available to us at time of publication. Following each is a code indicating the Volume number and issue in which that product's report appeared. Some products will be listed on which our official test reports have not yet been published. These are marked (NR).

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

Some of the listed items are discontinued models (‡), retained here because their durability and performance distinguish them as "classics," and because they are sometimes available for substantially less than their original cost. Upgrade modifications are available for many of them.

Component classes are as follows:

Class A: Best attainable sound, without any practical considerations; "state of the art."

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

Class C: Somewhat lower-fi sound but far more musically natural than average home component high fidelity.

Class D: Satisfying musical sound but significantly lower fidelity than the best available. Below this level, system colorations start to become so great that selection must rely more upon personal taste than considerations of accuracy.

With this issue we have added Class K, standing for "Keep your eye on this product." Class K is for components which we have not tested (or have not finished testing), but which we have reason to believe will be excellent performers. Please keep in mind that we are not actually recommending these components, only suggesting that they are worth looking at (and listening to).

Components are listed within each class in alphabetical order.

TURNTABLES

(A)

Goldmund Studio
For $4900 (turntable with linear-tracking arm) you get gorgeous appearance, direct drive, fussy setup, and a degree of tonal neutrality and resolution not found in other turntables. (NR)

SOTA Sapphire Star (vacuum hold-down)
Somewhat better in all respects than the standard SOTA, itself an excellent performer. The vacuum holddown feature has significant importance in resisting acoustic feedback and damping vinyl resonances. This unit uses constant low vacuum rather than an initial high vacuum. (Vol. 7 No. 2)

(B)

Linn-Sondek LP-12
The standard against which newer turntable designs have been measured for ten years now. Although somewhat more colored than the other 'tables, the Linn is an extremely good performer, albeit a bit difficult to use (e.g., changing from 33 to 45), and notoriously difficult to set up. (NR)

Pink Triangle
This latest entry from the U.K. has a light suspension unsuited for use with very heavy tonearms, a solid acrylic platter, good construction, and excellent performance. (Vol. 7 No. 5)

SOTA Sapphire
The first high-end American 'table since the original AR, the SOTA is easy to set up and use, attractive, ingenious in design, and sonically excellent. (NR)

VPI HW-19

The design of the VPI has been evolving for over a year (new motor pulley, new spindle and bearing, reinforced subchassis), so be sure and get the latest version. The one we reported on has been superseded in a number of ways, and we have not tested it. The one we did test was a mechanically solid, well-engineered product with very good sound. You'll find the suspension harder to adjust than the SOTA, but less finicky than the Linn. (Vol. 7 No. 2)

(C)

AR (new)

The new version of the AR is the only truly low-cost turntable (at $300) which we can heartily recommend. Compared to the original AR, it has much better cosmetics, seems sturdier, has provision for either its own tonearm or yours (a huge advantage over the original), but seems to have a less effective suspension. (Vol. 7 No. 1)

MAS Turntable

At $250 (minus arm), this is a true bargain. With a light but effective suspension, it is best used with medium-mass arms and medium- to high-compliance cartridges.

(K)

Precision Fidelity Sonographe ($395), Mapleknoll Air Bearing ($650 w/arm). Elite Rock ($800), Merrill ($600).

Deletions

The CJ Walker CJ-55 was removed because at its original price ($399) it could not compete with the AR or the MAS. There's a new version out for less money, but we haven't tested it.

Tonearms

(A)

Goldmund T-3‡ and T-3b

Usually sold with the superb Goldmund turntable, this is for use with medium to low compliance cartridges, and offers outstanding preservation of midrange and high frequency detail, soundstage information, and tonal neutrality. Comes with a preamp-like control center for raising and lowering the tonearm. (Vol. 7 No. 3)

(B)

Alphason HR-100S

The Alphason has the simplest appearance of the highly ranked arms, consisting of an S-shaped titanium tube which, as part of the same casting, flattens out into the cartridge-mounting platform. Very low friction. A big advantage is the availability of different tonearm tube and counterweight inserts to vary the effective mass and thus enable matching of virtually all medium to low-compliance cartridges (even some moderately high compliance ones). (Vol. 7 No. 3)

Sumiko "The Arm"

This is the pivoting arm against which other pivoting arms must be compared—and it should be, for $1200. Tonally very neutral, virtually nonresonant, and with high rigidity and close-tolerance bearings, The Arm also offers outstanding adjustability for fine-tuning to a variety of cartridges. Might make it into Class A, were it not for the outstanding performance of the twice-as-costly Goldmund. (Vol. 7 No. 3)

Technics EPA-100 Mk 2.

Ideal for high to medium compliance cartridges, VTA adjustable while playing, excellent bearings, anti-resonant boron arm tube. A bit hard to find in U.S. (NR)

Zeta

This performs almost as well as the Alphason but is less adaptable to moderately high compliance cartridges and costs more. Outstanding performance. (Vol. 7 No. 3)

(C)

Linn Basik LV-X

A good, relatively inexpensive ($200) arm for use primarily with moving-magnet cartridges. Very rigid and quite non-resonant, the LV-X offers tight bass, excellent detail and focus. Comes with non-standard removable headshell for easy cartridge changes. (Vol. 6 No. 6)

SME 3009-III

No longer competitive with the best there is but still excellent for high-compliance cartridges, the SME offers excellent tracking, low coloration, and reasonably easy adjustment of all parameters. (Vol. 6 No. 6)

(D)

MAS 282

Slightly more colored than the Mayware, the MAS is much easier to set up, available from dealers in the U.S., and only a bit more expensive at $169. Very similar to the old Infinity Black Widow and just about as good; definitely a good buy, but recommended primarily for medium- to high-compliance cartridges. (Vol. 7 No. 4)

Mayware Mk IV

A little fussy to set up, the latest incarnation of the Formula 4 has low coloration, low mass, and works well. Not distributed in the U.S., but can be purchased from the U.K. for about $100—truly a bargain! (NR)

(K)

Linn Ittok ($650), Premiere MMT ($225)

Cartridges

(A)

There may be Class A cartridges out there—the van den Hul EMT, the Koetsus, the best Dynavectors—but we haven't tested them.

(B)

Dynavector 17D

Medium-compliance MC cartridge, very detailed sound but a bit lean and cool—though not as much so as the Dynavector Ruby (23R). Superb rendition of high frequencies—response out to 100 kHz! Our samples had tracking problems with high-level midrange passages. Now replac-

ed by the model 17DS, not yet auditioned. (Vol. 5 No. 8, Vol. 6 No. 1, Vol. 6 No. 2)

Promethean Green

Medium-compliance MM cartridge (actually a reworking of the Grado F3), decent trackability, unusually good rendition of depth, spaciousness, and detail, somewhat soft high end. (Vol. 6 No. 6)

Shure V15-VMR

Exceedingly neutral midrange and bass, slightly soft high end, high compliance. You sacrifice a bit of detail for unsurpassed tracking ability, excellent reliability, and listenability. (Vol. 7 No. 5, Cheapskate)

Technics 100C Mk IV

Exceedingly smooth sound, tonally neutral, excellent trackability. The best moving magnet cartridge we know of when used with the EPA-100 Mk2 arm. (NR)

(C)

Shure V15 VB

Somewhat softer and less detailed top end than the VMR (above), otherwise identical in compliance, trackability, and sound. (Vol. 5 No. 7)

Astatic MF-100

Very high compliance, superb trackability, somewhat wispy high end, very slightly warm overall sound. (Vol. 5 No. 7)

(D)

Grado F3E+

High compliance, warmish balance, excellent depth and spaciousness.

Shure M95-EJ

Neutral tonal balance, softish high end, good trackability, high compliance.

(K)

Alchemist high-output moving coil, the various Kisekis, the Argent Diamond, the Alpha II.

(X)

Vitason VS-1000

Awesomely expensive, almost infinitely compliant, incredible trackability, but subtly lucid and fictitious. (Vol. 7 No. 1)

DELETIONS

The Robertson EK-1 was deleted because it's been some time since we heard it and may have been equalled by the much less expensive Technics; the Monster Alpha 1 was deleted following a review by JGH whow found it to have an intolerable rising high end; the Technics EPC-205 was replaced by the Technics EPC-100, which is far superior (though harder to get ahold of); the Sony XL-88 is not made any longer as far as we know; and the Shure M95-EJ was felt to be out of date, particularly when you can get the V15-VB for as little as $99.

COMPACT DISC PLAYERS

(A)

Yamaha CD-X1

Excellent disc-handling features with sound a shade better than the Magnavox; the best that we've heard from CD players. (Vol. 7 No. 6)

(B)

Magnavox/Philips FD-1000

Attractive to look at but a little clunky and slow in action, the Magnavox offers CD reproduction that is still superior to all but the Yamaha. (Vol. 7 No. 2)

Sony CDP-701ES

As many programming options as were offered in Sony's original model 101, this second generation player has even more: virtually all features on both main unit and remote-control; by index number; heavy-duty drive mechanisms; high grade capacitors; index selection of individual tracks. The sound is better than the 101 and comparable to the Kyocera, the user-convenience overwhelming, the cost high ($1500). Latest version not evaluated for sound quality, but supposedly improved. (Vol. 7 No. 2)

(C)

Sony CDP-101

This first CD player has been surpassed in sonic quality by a number of second-generation players, but its ease of operation is still almost unequalled. A new, and as yet untested, version of the 101 is reported by other magazines to be sonically equal to the Magnavox. (Vol. 6 No. 6)

(K)

The NAD ($500), the Mission ($600), the Meridian, the Revox ($1150).

PREAMPLIFIERS

(A)

Audio Research SP-10

A very high-priced preamp ($3450) with almost all of the virtues of tube equipment and none of the typical euponic errors. The highs are extended and wonderfully detailed, and the low end excellent though not as good as the best solid-state preamps. Overall, the feeling of 3-dimensional music in your home is conveyed as well as anything we've heard, with an emphasis on high frequency openness. The SP-10 comes with excellent controls which include provision for cartridge loading and switchable gain for MC cartridges. Used with MCs there is somewhat more noise than would be the case if a solid-state stepup were used. (Vol. 7 No. 3)

Conrad-Johnson Premier Three

The Premier Three matches the SP-10 in overall quality of performance, but with a different emphasis. In areas where tubes normally excel (luscious midrange, 3-dimensional focus), the Three is the best. In the high frequencies, the Three is slightly soft and sweet. Controls are adequate but not extensive; for use with an MC cartridge an auxiliary stepup device is recommended—possibly C-J's HV-1a. (Vol. 7 No. 3)

(B)

Berning TF-10

For a long time our reference, the original version of this preamp has now been superseded in sweetness and detail by Conrad-Johnson, Audio Research, and (on preliminary hearing) the Klyne

SK-4 and 5. Still, this hybrid (tube/FET) preamp offers superb, very neutral sound and excellent control facilities. A new version is said to have even cleaner and more open sound, and can be equipped with a high gain section for moving coil cartridges at the user's option. (We hope to have our TF-10 updated and will report; in the meantime, Berning remains a very solid company whose products have stood the test of time.) (Vol. 4 No. 4)

Conrad Johnson PV5

Competitive in price with the other Class B units ($1485), the PV5 is simple-looking and sounds wonderful. We suspect a bit of euphonic sweetening, but it seems to get in the way of the music so little, who cares? A particularly attractive characteristic for those of you with CD players. Our current reference—until replaced by the C-J Premier Three. (Vol. 7 No. 3)

(C)

Audible Illusions Modulus 1

This little wonder, at $450, offers quite good tube sound. The Modulus 1 does a great job for little money. (NR)

Conrad-Johnson PV4

The PV4 provides, at $495, the classically easy sound of tubes as well as most of their errors: the low end is a bit inflated and loose, the high end noticeably rolled off. The midrange and soundstage presentation are just short of excellent. Significantly, there are very few tube units at this price. (Vol. 7 No. 6)

PS Audio Model 1VK

In its most recent incarnation the PS Audio preamp costs more than it used to (now $650) and sounds much better. The low end is superb, the high end very extended, the imaging specific. It still lacks the lusciousness of tubes, but is tonally very neutral. Good switching facilities, an MC gain stage, and adjustable cartridge loading. (NR)

(D)

BRB Model 10‡

BRB unfortunately went out of business before we could publish our review of their excellent little preamp. It should still be possible to pick up a sample at low cost. Be sure and listen before you buy; our first sample had excessively high distortion, the second was very good. (NR)

Conrad-Johnson PV-3

At $300 in kit form, this is the least expensive preamp we can recommend. The switching facilities are limited, the volume control doesn't maintain channel balance, and it's somewhat colored (warm bass, rolled-off high end), but the sound is attractive. Excellent for use with Compact Discs. (Vol. 5 No. 10)

Dynaco PAS-3X‡

Owners of this venerable classic should not yet throw it out; if you come across one at a garage sale, snap it up. Replacement of capacitors, upgrading of the rectifier and power supply, and replacing resistors can turn the old PAS-3X into a very respectable preamp. The Van Alstine-modified version ($160) rivals much more expensive modern units. (NR)

(K)

The Klyne SK-4 ($1950), Conrad-Johnson PV6 ($800), Precision Fidelity C8 ($699), Superphon ($395), Sumo Electra ($395), PS Audio kit ($325).

Deletions

The Esprit TA-E900 was dropped because it's distributed hardly at all and because we haven't heard it in 3 years; the Denon PRA-2000 was dropped for similar reasons; the Precision Fidelity C8 had some problems and the current version is different and untested.

Moving Coil Stepup Devices

(A)

Counterpoint SA-2

One of the two best stepup devices we've heard; also the most expensive at $900. Superb preservation of detail, low distortion, lovely midrange. The noise is noticeably higher than with the Klyne (see below), but the problem with the bass on early units has been corrected. Comes with an interesting tube bias adjustment for tailoring the sound to your tastes; the SA-2 can be made to sound rich and euphonic or somewhat lean—as long as you don't go crazy wondering what's right. (Vol. 6 No. 3)

Klyne SK2a

A close rival to the Counterpoint, the basic difference here being solid- state versus tube. Superb bass, very deep and tight, excellent high frequency extension, excellent imaging. It still lacks the 3-dimensionality of tubes, but only slightly. Easily adjustable high-frequency rolloff and cartridge loading, a tremendous boon for those with several MC cartridges. Given the quality of construction and the excellent sound, a bargain at $695. (Vol. 7 No. 3)

(B)

Esoteric Audio Research TX-4 "The Head"

This is the best transformer we've listened to. Besides having traditional transformer virtues (no noise, great smoothness), the Head has excellent high frequency extension and very good bass—not as good as the Klyne but markedly better than the Counterpoint in that respect. Some people won't have anything but a transformer as a stepup device; this is the best one. (Vol. 5 No. 5)

(C)

We really haven't done our homework on Class C and D stepup devices, but we *have* gotten the assignment—a report will be forthcoming. Look into the Audio Interface transformer (the best one short of the Head that we've heard) or the PS Audio moving coil stepup which does very well for an inexpensive solid-state stepup.

Amplifiers

(A)

Audio Research Corporation D-160B

At $6000, this is the most expensive amp we've ever reviewed. According to William Z. Johnson,

it's a bargain at the price. It provides extraordinary musicality and very extended and controlled low and high frequencies. ARC also makes a D-250 which is more powerful and costs less; it's still not clear which is the better amp. (Vol. 7 No. 3)

Conrad-Johnson Premier One

This very high-powered (200 watts/channel) tube amplifier is good enough to turn Acoustat 2+2s into a nearly state-of-the-art speaker system. It also works very well with other electrostatics that can handle the power, and dynamic systems with extended high frequency response and well-damped woofers. (Vol. 6 No. 5)

Conrad-Johnson Premier Four

A different topology and output tube than the One, the Four provides only (!) 100 watts per channel. It is tonally more neutral than the One, with more extended highs and less warmth at the low end (though less power as well, if put to the test). The Four has to be considered one of the best amplifiers available, with an emphasis on traditional tube virtues. (Vol. 7 No. 3)

Electron Kinetics Eagle 7A

The best solid-state amp we've ever heard, and our current reference amp. Terrifically punchy, the Eagle will dim your room lights on dynamic program material unless you have very efficient speakers. Doesn't work well with the electrostatics we have on hand, but brings out the best from dynamic loudspeakers. This amplifier has enough output current to weld with, so be careful. (Vol. 7 No. 1)

Paoli S.O.B.

The little-known Paolis (they come as two mono units) have the most stunningly natural high frequency reproduction we've come across. Stunning, typically tubelike tautness and soundstage, with a very *un*-tubelike tautness and impact at the low end. Not quite as effortless as the C-J Premier One at very high listening levels, but otherwise sonically superior in every respect. This should be an ideal mate for the Quad ESL 63s. No-holds-barred construction makes this very expensive (ca. $2000 each), but they're sold factory-direct with a money-back-if-not-satisfied guarantee. (Vol. 7 No. 1)

Threshold S/500 Series II

The recent update of the S/500 made a significant difference in the sonics. It now sounds very much like an excellent tube amp at the high end, but is more extended than most tube amps. The low end remains impressive, though not as punchy as that of the Eagle. Part of the Series II version was an increase of output amperage (to 45), so it should drive almost any load. Probably a more universal amp than the Eagle (good on just about any speaker), but not as ideal a match for the Watkins. The S/150 and S/300 also have Series II updates and we're told they sound similar but with less power; we haven't tested them. (Vol. 6 No. 5, Vol. 7 No. 5)

(B)

Electrocompaniet Ampliwire II

A low power (50 watts per channel) but high current solid-state amplifier that has great purity at high frequencies, very neutral tonal balance, and will play surprisingly loud. Unlike most amps, this one works well on almost any loudspeaker, excluding very inefficient ones. We have had significant trouble with one channel going out (on five amps so far), and it's particularly a problem with high capacitance speaker cables. There is now available quite a different version of the Ampliwire II, which reportedly addresses the reliability problem and sounds different; we haven't heard it. (Vol. 6 No. 6)

Esoteric Audio Research 509

In certain circumstances this 100-watt tube amp will make a system literally come to life. It possesses unusual capabilities at rendering 3-dimensional images and can make music very lifelike. For a tube amp it has superb low end, though still not quite as good as the best solid-state amps. Did the best job at making the Quad ESL-63s sound real, and worked quite poorly with the Watkins WE-1. (Vol. 6 No. 5)

(C)

Acoustat TNT-200‡

Acoustat is now out of business, and their TNT-200 has had lots of competition since we first reviewed it. It still is a very high power amplifier with superb bass control and high frequency extension. Over long periods of listening a certain lack of ease seems to creep in, and depth presentation is significantly less than the best. Should be a good buy on the used market or in dealer closeouts. (Vol. 5 No. 5)

Amber Series 70

The Amber is an unusually good value; for $579 you get plenty of power and excellent low end. The high end is a little crisp and the sonic perspective a little flat, but these deficiencies are not so severe as to make it unenjoyable. A good buy. (Vol. 6 No. 1)

B&K ST-140

The B&K costs little enough ($395) to make it into Class D and the sonics are almost good enough for Class B. It features a very easy and enjoyable high end, deep but not extraordinarily powerful low bass, and good performance elsewhere. We can't figure out how B&K does so well for so little, but consumers are well advised to snap up the ST-140 before B&K changes their mind about the price. (Vol. 7 No. 4)

Berning EA-230

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

VSP Labs TransMos

Similar in design configuration to the Acoustat but costing $125 less, the VSP Labs has an unusual amount of heft and authority at the low end, excellent midrange, and a slightly closed-in high end—which in many systems can be a seductive attribute. Its 150 watts don't sound quite as powerful as the Acoustat's but they should be enough for almost anyone; if not, two of the amps can be operated in a bridged mode.

Available as an easily assembled kit for $125 less, making it a somewhat high-priced bargain. (Vol. 6 No. 5)

(D)

Hafler DH-220

Lots of power and tonally neutral, this latest version of the Hafler is an excellent amp for those on a low budget. The kit version is easy to put together and makes the amplifier very cost-effective. Compared to the amplifiers in group C, the Hafler is slightly dry-sounding at the high end. (Vol. 6 No. 5)

Jensen's Stereo MOSFET 120B

If you already own a Dyna Stereo 120, Jensen Stereo's rebuild of it will give you a remarkably powerful-sounding amplifier with excellent inner detail and visceral low end. No other expenditure of $220 will buy you as good sound. (Vol. 7 No. 1)

NAD 3020

The 3020 is an integrated amp that makes tradeoffs in parts cost which affect the sound relatively little; the result is very listenable if not the ultimate. (NR)

Sonic Developments D-235

The least expensive high quality amplifier we know of, this dual 35-watter has surprising punch, smooth and open highs, neutral but slightly flat (constricted depth) midrange, and a taut, lean low end. (Vol. 5 No. 1)

(K)

Precision Fidelity M8 ($800), Sumo Andromeda ($750), Quicksilver mono 60-watters ($1000), Conrad-Johnson M75a ($1485)—and probably M45 ($1000), Audio Research D70

Speaker Systems

(A)

The WAMM System

This $42,000 system does everything extraordinarily well (delicacy, balance, authority, pinpoint imaging), but in two respects it's unequalled. No other system we've heard does as well at telling you what the other components in your system are doing; and none other gives you the feeling of weight and authority of a live symphony without overdoing it. At the price, though, it's hard to believe anyone wouldn't prefer to go to the symphony 2500 times.[1] (Vol. 6 No. 3)

(B)

Acoustat 2+2‡

The 2+2s are Acoustat's best realization of the electrostatic speaker to date, though they may be revalled by the 1+1s. With the best electonics (the C-J Premier 1 or the Paoli S.O.B.s) the sound is very revealing and gorgeously listenable, but a little lacking in impact. (Vol. 7 No. 2)

Quad ESL-63

This is the reference for many reviewers in the U.K. It's the best-integrated speaker we've heard, with pinpoint imaging and a seductive coherence. At the same time, the ESL-63 is best kept away from large rooms and high-powered amplifiers; it can't fill the former and may get fried by the latter. Very high resolution at relatively restricted SPL. (Vol. 6 No. 4, Vol. 6 No. 5, Vol. 7 No. 2)

Thiel CS3

Very deep, tight low end, very extended highs, coherent midrange; the imaging is as good as we've heard. If you're thinking of spending $1800 for a speaker, listen to this one. A warning: the CS3s are not particularly forgiving. Preamps with a little brightness, an amplifier with inadequate drive at low frequencies, cartridges with a rising high end are all out of the question. Uses an active bass-boost equalizer (supplied). (Vol. 7 No. 3)

Watkins WE-1

After nearly a year of living with it, the WE-1 remains one of the most listenable speakers we've heard. We originally criticized it for a somewhat ill-defined low end and slightly rolled-off high end. Changes in the rest of our system have made even those criticisms nitpicks. Superb top-to-bottom balance and overall listenability. Best used with high-powered solid-state amps; the Electronic Kinetics Eagle 7a is recommended. (Vol. 6 No. 5)

(C)

Dayton Wright LCM-1

The LCM-1s do unusually well at the low end for a bookshelf speaker, have extended high frequencies, and are quite good in between. Moreover, they convey musical dynamics better than any of the relatively low-priced competition (the cost $500). An excellent, well-balanced speaker, but quite critical of room placement. (Vol. 7 No. 2)

Fourier 6

Peter Aczel has come up with a winner in the bass-reflex Model 6. The speaker is not perfect—the low end is a little loose and there are some "boxy" lower midrange colorations—but its overall performance is very listenable and dynamically effortless. Compared to the Spica TC-50 there is less feeling of absolute coherence and less specific imaging, but a more satisfying frequency balance. (Vol. 7 Nos. 3&4)

Phase Tech PC-60

Bill Hecht has been making speakers OEM for Fisher and the like, but now he's come up with one of his own, and it's a dandy. The PC-60 uses a patented flat, expanded polystyrene woofer that provides the best low end we've heard from a small speaker, and it's well integrated with the tweeter though there's a slightly wiry quality at high frequencies. Very good for $400. (Vol. 7 No. 4)

Rauna Tyr

The Tyr is an unassuming-looking speaker from

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1 I, for one, wouldn't. You'd spend most of that travelling the world to find the range of repertoire available on recordings. Unless one lives in a major city, "the symphony"—meaning, presumably, the local symphony—is likely to be mediocre, uninspired, and locked into a narrow repertoire.
JGH

Sweden with a concrete enclosure and surprisingly low price. "They sound almost astonishingly good . . . the most immediately striking thing about the Tyrs is their musicality; they reproduce *all* instrumental timbres with startling accuracy." There is a very subtle snarly quality to the sound, but it doesn't detract enormously. Good with both tube and solid-state amps. (Vol. 7 No. 4)

Spica TC-50

Used with a subwoofer, the Spica is good enough to be included in group B. The coherence and imaging of the mid- to upper-midrange rival the Quads and would be considered excellent in a speaker of any price; at $420 they're a steal. The high frequencies roll off above 14 kHz and the low end is designed to be very controlled down to the lower limit of about 55 Hz. This makes it perfect for matching to a subwoofer, but it sounds a little lean as a stand- alone. An excellent speaker. (Vol. 7 Nos. 2&3)

Thiel 04a

This relatively low-priced (now $750) floor-standing speaker from Thiel is very listenable and represents good tradeoffs. The 04a has surprising low end, extended and seductive highs, and good imaging. (Vol. 6 No. 6)

(D)

Bill Reed 6-02

One of *Stereophile*'s best discoveries, the 6-02 offers respectable, full-range sound out of a bookshelf speaker at only $295 (in kit form). Good balance, very alive sounding, respectable low end. (Vol. 7 No. 3, Vol. 7 No. 1)

Fried Q/2

A small speaker which reproduces musical dynamics remarkably well. Well-balanced generally, but with a degree of brightness which must be matched to complementary components. Quite good low end. (Vol. 6 No. 4)

Spectrum 208A

The Spectrums are another discovery, and a very good, well-rounded speaker. Surprisingly good low end. Won't go well with many low-priced amplifiers and preamps because they're so revealing at the high end. (Vol. 6 No. 2)

DELETIONS

The Morel MLP-202 was dropped because the model we reviewed is not current, and was felt to be uncompetitive with the many good speakers available.

SIGNAL PROCESSORS

(A)

Benchmark Acoustics ambience restoration system‡

A perfect example of the marketplace failure of a superior product, this was the best surround-sound (ambience) extractor we ever tested. Well worth buying if you can find one, anywhere. (Vol. 5 No. 6)

dbx 150 NR device

Ideal simultaneous encode/decode noise reduction device for serious open-reel tape recordists. With twice as much noise reduction action (20 dB) than Dolby B, it does not require Dolby's level setting for accurate tracking. Not recommended for cassette recording. (NR)

dbx 224X NR device

Two-pass (encode/decode) dbx-II noise-reduction device for cassette record and playback, and dbxed disc playback. Gives 30 dB of S/N improvement. (NR)

Packburn 323 and 103 disc-noise-reduction devices

Quite expensive, and frankly intended for professional (archival) use, these are the best such devices made. These can remove the maximum of surface noise—ticks, pops, and hiss—from shellac or vinyl discs with a minimum of signal degradation. (Vol. 5 No. 8)

(B)

dbx 3BX-II dynamic-range expander

Mainly for the classical listener, the 3BX restores much of the original dynamic range to compressed recordings with minimal side effects. Its major disadvantage is the likelihood of overuse; expansion must be conservatively applied to most discs to avoid "pumping" and exaggeration of dynamics. (Vol. 5 No.9)

KLH TNS-7000 transient-noise suppressor‡

An amazing device for its modest price, the TNS-7000 can eradicate about 90% of the surface-noise ticks and pops from discs without otherwise affecting the sound. It does not attenuate high frequencies. A boon to the person who owns many valuable discs with much accumulated surface noise. (Vol. 4 No. 8)

KLH 1201A dynamic hiss filter‡

This is quite effective at removing hiss from tapes and discs, but optimum settings involve a compromise between acceptable quieting and acceptable loss of high frequency content. (Vol. 5 No. 6)

RECORDING EQUIPMENT

(A)

Nakamichi DMP-100 PCM processor

Almost identical to the Sony PCM-F1, the DMP-100 is built by Sony for Nakamichi, but has some additional work done by Nak to the analog circuitry. Based on long-term memory, the DMP-100 sounds better—call it 99.8% perfect. (Vol. 7 No. 5)

Nakamichi ZX-7 cassette deck

Excellent controls and adjustments, very extended high frequencies, sophisticated tape transport. Gives up a little in sound quality to the Tandberg, but otherwise excellent. (Vol.7 No. 1)

Sony PCM-F1 digital audio processor

Reports from some quarters of difficulty with live microphone feeds have not been confirmed in our use, nor have problems with dropouts occurred. Professional recordists report some (but not huge) differences between their F1 tapes and the same performance on 30-ips masters made on highly modified $50,000 analog machines. The first and only 99.7%-perfect home recording system, and priced below $2000, including VCR. (Vol. 5 No. 7, Vol. 6 No. 1)

Tandberg TD20A Open Reel Tape Recorder

The best buy in an open-reel deck, this offers professional-calibre performance at a modest ($1150) price. Better sound than many

professional decks. (NR)

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

(B)

Revox B-710 cassette deck
A superb performer with its own tapes—neutral, liquid-sounding. Bias and azimuth require manual adjustment—tapes made on other machines are unlikely to sound right at the high end. Very rugged transport mechanism. (Vol. 7 No. 1)

Tandberg TCD-3004 cassette deck‡
Designed in 1978, the 3004 was the predecessor to the 3014 mentioned above, and shares the rugged transport and excellent midrange headroom. It lacked Dolby C and had a somewhat more rolled-off high end but is still very serviceable on the used market. (Vol. 7 No. 1)

(C)

B&O 9000 cassette deck
An $1800 tape deck hardly belongs in group C, but the B&O is an excellent machine, especially for the person who just wants to hook it up and use it without a lot of diddling around. Very sophisticated transport controls, and sound that is slightly less good than the other tape decks mentioned. (Vol. 7 No. 1)

(K)

Nakamichi Dragon (approx. $1700), Technics RB100 ($850), Harmon Kardon

Headphones

(B)

Signet TK-33
Clean, smooth, slightly laid-back, good bass.

Record-Care Products

(A)

Keith Monks record cleaner
The Rolls-Royce of record launderers, this will eliminate from any disc every last vestige of surface noise that doesn't stem from permanent groove damage. This, the Nitty Gritty, or the VPI are must-haves for every serious record collector. Don't overuse; the longterm effects of frequent record cleaning are as yet unknown.

LAST record-preservation treatment
This actually works. It significantly improves the sound of even new records and is claimed to make them last longer, though we haven't used it long enough to verify the claim. (Vol. 7 No. 3)

(B)

Nitty-Gritty 2.5, 3.5, and Pro record cleaner
Instead of a vacuuming tonearm (as with the Monks), the NG models use vacuum slots. The cleaning is efficient but they're noisy and harder to use than the Monks. The Pro model cleans both sides at once and may belong in group A, but has not been tested. (Vol. 5 No. 2)

VPI HW-16 record cleaner
Operates in the same fashion as the Nitty Gritty, but with more powerful motors, more noise. Same cautions as with Keith Monks and Nitty Gritty. (Vol. 5 No. 7)

(C)

Decca or Statibrush record brush
Properly used (held at a low angle to the approaching grooves and slowly slid off the record), these are the most effective dry record cleaners available. And they work on low torque 'tables. Better than the DiscWasher for everyday use.

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

Audio Interconnects

(A)

Monster Cable Interlink Reference
Excellent focus, clarity, purity, and resolution. Don't work ideally in all systems, but do in most.

Petersen

Livewire

Straightwire

(B)

Apature
Slightly soft at the high end, otherwise neutral.

JG Acoustics
Virtually identical to Apature, significantly more expensive.

Cotter or Verion‡
A little hard in the treble, slightly pinched in the upper midrange; otherwise very good.

(C)

FMI audio interconnects
Lush, liquid, somewhat tube-like in sonic character.

The world's finest audio interconnect cable.

How to buy a $2000 preamplifier for $80

Unbelievable but true.

Interlink Reference will improve your sound system to a degree normally associated with some of the world's finest preamplifiers and electronics.

Recall that first exciting moment when playing back one of your favorite recordings over a new piece of equipment ... The music sounded incredibly real. Details that you never knew existed on the record revealed themselves with stunning clarity. That's what you'll experience when you play your favorite recordings back using Interlink Reference cables in your sound system.

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THE AUDIO CHEAPSKATE MEETS THE TANDBERG 3002A and 3006A

Sam Tellig

Why is the Audio Cheapskate reviewing a $795 preamp and a $995 power amp? No good reason other than the fact the equipment happened to come my way, but it *is* interesting to stretch a bit. These Tandberg separates represent a step upwards in price from Hafler, Amber or the Denon combination reviewed in Volume 7, No. 3 (the PRA 1000 and PRA 1500). The preamp competes with the likes of the PS Audio IVH, the Precision Fidelity C8, and the Conrad Johnson PV6; the power amp competes with such heavies as the Acoustat TNT 120 (no longer made), the VSP 150, and the Sumo Andromeda.

Because the Tandberg equipment is made in Norway it arrives in the U.S. at a price disadvantage. There's shipping and customs, and of course Tandberg of America has to pay for its service and sales facilities here and also wants to earn a profit. I *know* why this equipment costs what it does, I just don't like paying it. It's the same situation you have with the Quad 33/405-2 or the Rega Planar 3 turntable; if you buy it where they make it, you get excellent value for the money. I can recommend the Tandberg 3002A and 3006A (subject to reservations expressed below) to all of our readers in Norway. Or in Britain, for that matter, where the equipment sells for considerably less than it does here.

But for this country, I have a strong prejudice towards buying American when it comes to high-end equipment. Maybe that's why I can't get enthusiastic about the Tandberg separates. Maybe more important, I have a feeling I wouldn't be excited about them even were I Norwegian. Construction quality is excellent, but I'm not crazy about the appearance (although this is a matter of personal taste). Nor am I excited about the sound, although there is nothing terribly wrong with it. The Tandberg separates do everything well, but nothing extraordinarily well. They don't offend, but they don't excite. This may have something to do with the Norwegian character—after all, Walter Mondale is of Norwegian ancestry. The Tandbergs are the Walter Mondales of audio equipment. My question: where's the beef?[1]

Of the two pieces of equipment, the preamp is the more attractive. At $795 it isn't a bad buy, especially if you're looking for a preamp with a very good built-in moving coil section and defeatable tone controls. It's not cheap, but then Tandberg didn't make their reputation with cheap. The problem is, there's nothing terribly exciting about the preamp. It has good imaging, good depth, and adequate dynamics. For about the same money, though, the C-J PV6 is significantly better, the PS is a little cleaner and more detailed, and I wouldn't be surprised to find the three tube preamps reviewed in this issue more interesting—for only $500! And next month I'll review the Superphon preamp (designed by Stan Warren, the S of PS Audio), which is cheap ($395) but not dirty—in fact, it's astonishingly good! You'll also see a piece on the Sumo Electra, which is an incredibly

1 Were it not for the excessive respect in which I hold the words of Sam Tellig, not to mention this chance to take a shot at him, I would have edited out this egregious reiteration of the most-rapidly-hackneyed phrase in American literary (?) history.LA

sleazy-looking preamp,[2] but sounds very good for the money—almost as good as the Tandberg—and has one of the best moving coil sections I've ever heard in a preamp.

I could love the Tandberg preamp more if: (1) the tone controls acually did something, but unfortunately the turnover points are 50 Hz and 10 kHz; (2) the preamp had a high cut filter; (3) the preamp were $200 cheaper. As it is, I can give it at best a lukewarm recommendation.

Almost the same can be said for the 3006A power amp, but it suffers even stiffer price competition than the preamp. Again, the operative word is bland. This power amp won't offend anyone; performance typical of MOSFET amps, of which the Tandberg is one. Like a lot of other MOSFETs, this amp has a smooth midrange, a silky, extended high end (maybe a bit overdone), and bass that's a little shy on impact. The Tandberg isn't bad in the bass, but it doesn't pack the subjective punch, say of a Denon POA-1500, a Harman/Kardon hk870, or a Threshold S/150, even though its 150 watts per channel is comparable.

I could say more about the 3006A power amp if I had used it more. But it was summertime—and the listening wasn't easy with this product. This power amp runs hot; much too hot for my liking. I have never had a transistor amp run this hot, although the old Audionics CC2 came close. The "heat-sink chimneys" (aptly named) helped heat up the listening room, and by the time early July came around, I had to get the Tandberg out of my system. On the other hand, if you are looking for a combination power amp/space heater, the 3006 may be just what you want.

For me the key issue is value for money. I'm willing to go with a somewhat Rolls-Royce product (RR is the image that Tandberg likes to cultivate)—witness my Quads—but only when you get a degree of Rolls-Royce performance. I'm just not all that impressed by the sound. You can do better for the money. I haven't heard all of the power amps around, but the Denon POA-1500 at $300 less is a much better buy. The Hitachi HMA-8500 lists for $700, but at least one mail order house was selling it for $469; that's a super buy. The Yamaha M-60, at $650, puts out 160 watts per channel and actually sounds better than the Tandberg. If you want to spend $1000, take a look at the 60-watt mono tube amps from Quicksilver. I did, and found them to be the best amp I've ever heard on my Quad ESL-63s and a very good deal, considering what it costs to make a tube amp.

I've figured out who's going to buy the Tandbergs. Some well-heeled non-audiophile (a physician maybe, or a dentist) who walks into a high-end store looking for M_____ or C_____. The sales person suggests a listen to Tandberg, and the customer may very well come away thinking the Tandberg sounds better. He'll be satisfied: the equipment is conservative, well-made, and probably quite reliable (only "probably" because I can't fathom how a product that runs that hot can keep it up). And our conservative non-audiophile will have a product that blends in with both the visual and sonic decor of his living room. Unfortunately, I suspect that few such people are avid enough to read this magazine—especially this department! For the audio enthusiast I think there are better places to put your money. **ST**

2 Does that make it the Reagan administration of preamps? LA

MOSCODE™ TUBE CIRCUITRY

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In spite of their aesethetic supremacy tube circuits are not perfect (how disappointing). Consider the following—No tube amplifier can deliver a great deal of current to either low efficiency or low impedance speakers. There is a need for periodic bias and balance adjustments, and the inevitable need to replace tubes. There is another very unfortunate fact about tube products—they are expensive.

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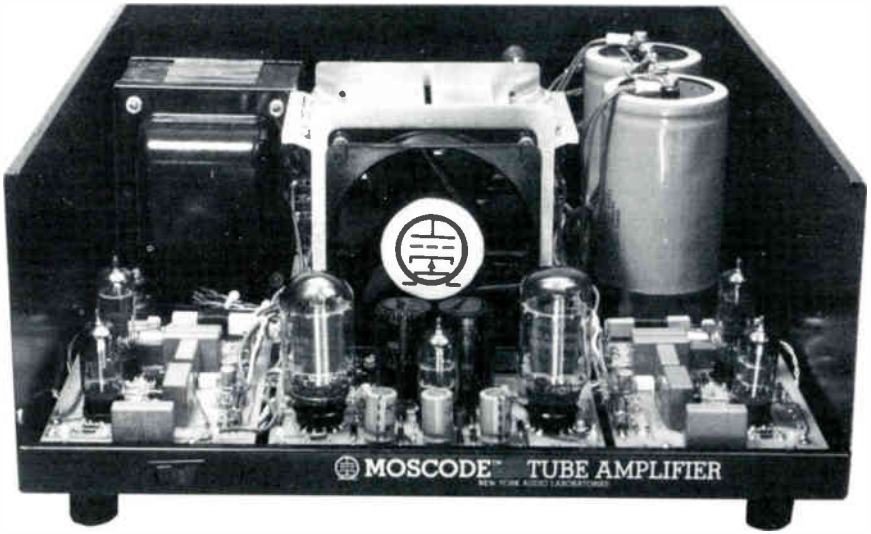
The MOSCODE™ 600 tube amplifier will deliver 300 watts per channel into 8 ohms—price $1599. Beside the tube input stage there is tube voltage regulation. The MOSCODE™ 300 is rated at 150 watts per channel into 8 ohms ($899). To compliment these tube amplifiers we have a tube/Mosfet preamp with 80 db of gain called the MOSCODE MINUET ($599), which has an optional tube regulated power supply ($300). Of course we had to design and manufacture a tube FM tuner entitled MOSCODE MAJOR ARMSTRONG ($600). All of these products are available in kit form.

I suggest two things, first—read all about it in *UNDERSTANDING TUBE ELECTRONICS* and secondly—do not briddle your enthusiasm and run, walk, jog, fly, sky dive, bicycle, motorcycle, ski or catapult yourself down to your local hi-fi emporium and compare these new MOSCODE TUBE CIRCUITS to your favorite state of the art electronics and by all means compare them to Futterman amplifiers. Send $3 domestic and $5 foreign to:



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MISCELLANY

DIGITAL AUDIO

Wayne Green, the *wunderkind* of computer magazines, is launching yet another magazine, this one in our own field. Called *Digital Audio*, it will cover "every aspect of the new digital sound recording technology—Compact Disc players, home and commercial playing systems, CD recordings, and anything else relevant to digital audio."

Published in Peterboro, NH, *Digital Audio* will be edited by Larry Canale, a former music reviewer for the Batavia, NY, *Daily News*. Canale is said (in the press release) to enjoy writing, photography, tennis and golf. Not audio?

MG BOWS OUT

Former Music Editor Margaret Graham (AKA Mrs. Polly Holt) is no longer in residence with us or writing for this magazine. An innocent victim of the financial problems plagueing *Stereophile* until its current publisher arrived on the scene in 1982, Ms. Graham took the Holt children (but no audio system) and moved to Boulder, CO to "put her life back together."

Why the nom de plume all these years? When Polly first started doing record reviews for the magazine, we wanted to get unbiased reader reactions to them, and figured the best way to do this was to *not* identify her as the Editor's spouse and drudge. By the time it made sense to do so, she was so well known as Margaret Graham that it was decided not to rock the boat.

GOING DIGITAL

Putting his money where his mouth is, JGH purchased a Sony PCM-F1/SL-2000 recording system, and is going berserk with it all over Santa Fe, recording everything he can aim his mikes (PZMs and an AKG C-35) at. Will any of the recordings ever be commercially released? Could be. . . .

EARS

The following is printed in full from a press release:

"The Esoteric Audio Rating Society (usually known as EARS) is San Antonio's premier audio club. Its members consist of audiophiles and music lovers who share a mutual interest in enhancing their enjoyment of recorded music. EARS meets bi-monthly and has been fortunate to offer interesting presentations on audio, recordings, and music. The club also has an ongoing project of recording local concert activities for radio broadcasts or other purposes. Additionally, EARS is currently trying to launch a club newsletter. Anyone interested in finding out more about EARS should write to the following address to obtain information on the next meeting date and location. EARS, P.O. Box 27621, San Antonio, TX 78227."

QUICKIES

BRB 120 AMPLIFIER

Solid-state stereo power amplifier; 60 watts per channel into 8 ohms. Original list price: $669. MANUFACTURER: BRB Systems, P. O. Box 2235, Sunnyvale, CA. 94087.

Publisher's Note:
What follows is unfortunately a posthumous review; BRB is no longer in business. At last report they still had a small amount of inventory being sold off at bargain basement prices, which is why we print this abbreviated report. In any case of a defunct manufacturer, caveat emptor applies with double force. On the other hand, BRB is keeping a PO box for warranty enquiries and we have experience of their having resolved at least one complaint satisfactorily.

On first listen to this amplifier, I was overwhelmed by how absolutely crummy it sounded. It was dry, gritty, dimensionless, and about as unrewarding to listen to as digital's worst critics claim it to be. I was told by the manufacturer, however, that the amp had to remain on for a *week* to stabilize!

So I left it plugged in for the recommended week, and guess what? An entirely different amplifier. It's still no Premier One or Eagle 7A, but it is one of the more graceful-sounding amps I've had the pleasure of hearing for some time.

For me, one of the acid tests of a power amplifier is how long it takes, when driving an electrostatic high end, to drive me bananas. The BRB took six hours, which puts it on a par with the VSP Trans-Mos, the Acoustat TNT-200 and the Threshold S/500. It is, however, better suited for use with dynamic systems.

The 120 has what I would describe as a light sound—somewhat forward, a little bright, but by no means hard or steely (although a bright speaker system would overdo things). It has tremendous solidity and impact at the low end, though not quite comparable in this respect to the Amber Series 70. Imaging is precise and solid, though not extremely spacious as from the Acoustat or the Threshold. It should be obvious by now that I think this is one very nice little amplifier. I would put it on a par with both the VSP Trans-Mos 150 and the Amber Series 70. **JGH**

HOT NEWS

● Trans-Audio Corporation, Canadian manufacturer of the Oracle turntable, has had their telephone disconnected, and unconfirmed rumors have it that negotiations are under way for the company's sale to a Japanese firm.

● Loudspeaker manufacturer Pyramid, Inc., has apparently also gone under. Their telephone was answered by a representative of the IRS.

● The assets of Acoustat Corp., which went into Chapter 11 a couple of months ago, will be sold on November 2 to a company called Panna Enterprises for $200,000 "unless a better offer is forthcoming."

● The Mark Levinson company has temporarily suspended product production, pending the settlement of a dispute over former owner Mark Levinson's participation in the firm. A spokesman for MLAS assured us that product sales are good, the firm is NOT in financial trouble, and business activities will resume upon settlement of the current disagreement.

● A rumor that McIntosh Labs, the oldest American-owned audio electronics manufacturer, was in bankruptcy has been vehemently denied. McIntosh is in fact curious to know who set that rumor in circulation.

● The Meridian CD player, just received for testing, is unquestionably the best sounding player we have heard to date. A full report is slated for an upcoming issue.

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EVER WONDER WHY your speakers don't sound as good in your home as they did at the audio salon? Attractive, effective solutions for your room acoustics problems. Free brochure. *TACET Enterprises, P.O. Box 4381, Akron, Ohio 44321.*

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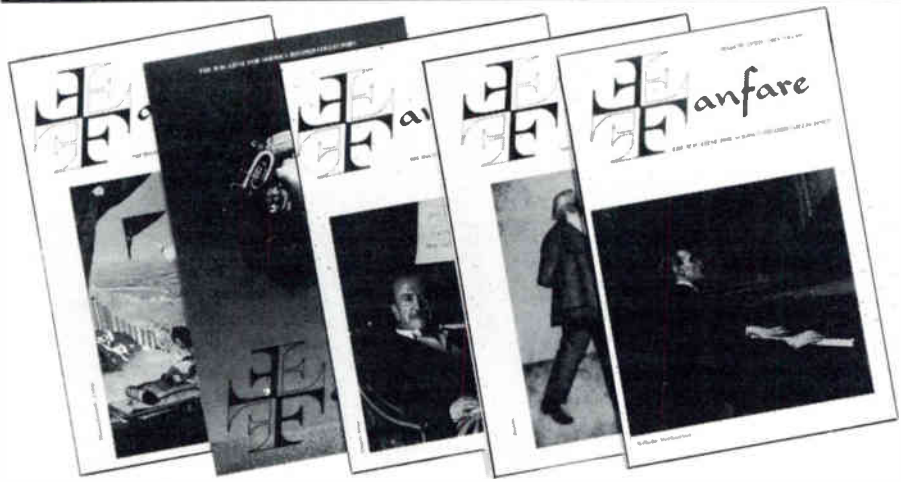

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WANTED: Spectral DMC-10 preamp, any version; Sumiko MDC-800 tonearm, Fulton tonearm; *Gary Granger (419) 243-0054.*

WANTED: old issues or copies of Listener's Review Finder, HiFi Dealer News (British) and Critical Record Review; *George Mileon, 14 Border Street, Lynn, MA 01905.*

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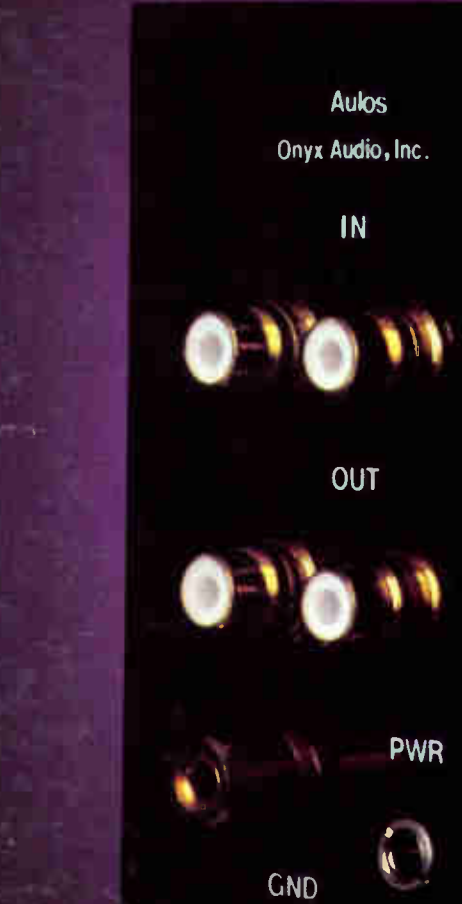

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