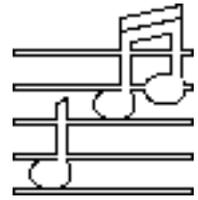


AUDIO BASICS



A MONTHLY NEWSLETTER OF AUDIO INFORMATION

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“Live” Music Doesn’t Necessarily Sound Real or Best

I recently attended a “live” performance of the great Broadway musical *Chess* at the Ordway Music Theater in St. Paul, Minnesota. The Ordway is a new and beautiful performing arts theater modeled in the European tradition and stunningly finished in woods and cloth. The purpose of a great concert hall is of course to act as a natural acoustic amplifier – to project the voices and instrument sounds so that all can easily hear the performance. Obviously, the design of the concert hall should make the use of electronic amplification redundant, shouldn’t it?

Imagine my dismay to find that *Chess* was completely electronically amplified with all the performers wearing wireless microphones. Wireless microphones are absolutely the most awful torture instruments yet invented. Their pathetic dynamic range and boom box frequency response transformed the play into a parody of itself. I could not understand the words of any of the songs when sung by more than one person at a time. The performers’ voices went into hard clipping when they sang at anything greater than about one-fourth power. There was no tone quality, no definition, no musicality, no dynamic range, and no enjoyment. I could have done as well with a cassette tape in a boom box turned up to full distort. Talk about no image - the “noise” (certainly not sound) didn’t come from the performers at all. It was simply splattered all over from the giant PA speakers piled in a huge stack on each side of the stage.

It was really silly sitting there thinking to myself, “This play sounds much more musical and natural at home on CD through my high fidelity audio system – at home I can understand all the words.” But my thoughts were true. I looked around and noted that most of the audience was smiling at the torture. (The highs sounded like fingernails on a blackboard, the bass like whales farting, and the mids were a mixture of mud and ground glass.) Then I realized the audience was smiling because this was the kind of excruciatingly bad trash sound they were used to and expected. They started with TV sound when they were little, then PA sound in Jr. High at the gymnasium band concerts, followed by worse PA sound in high school at all events, and for more normal entertainment they went to discos to really get their ears burned out.

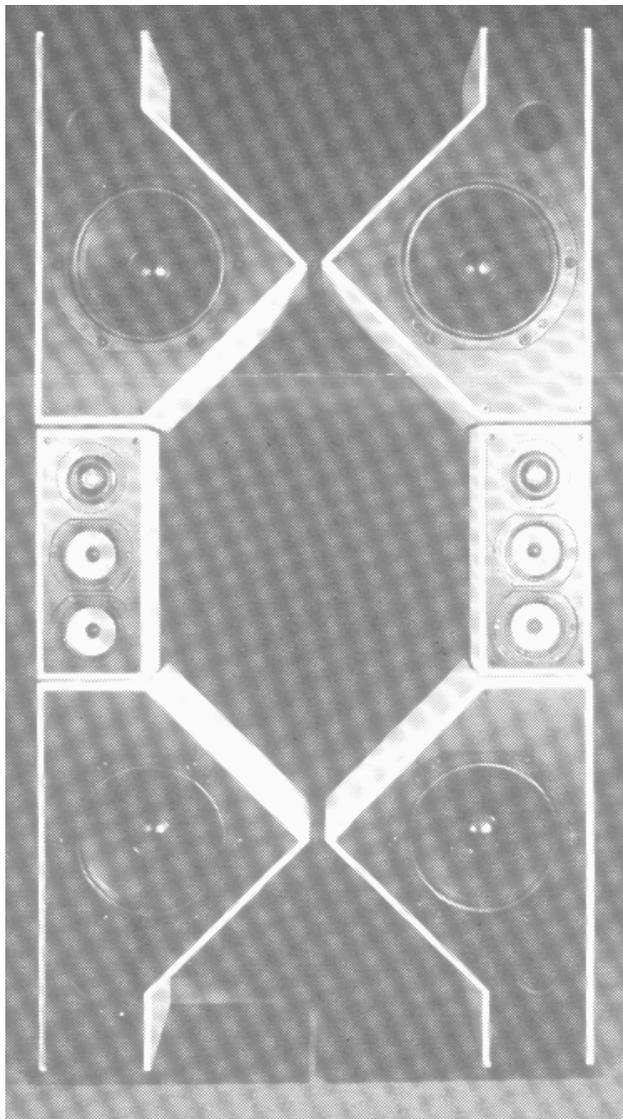
Now they could get fed garbage at a “live” concert and sit there and slurp it up and think they were enjoying it. Ah how many ways trash can be packaged and served up to fools these days. Just think how easy this makes selling discount barn packaged plastic rack stereo systems! For that junk is actually better than what they are used to listening to live.

As for me, next time I will inquire if “live” is actually “live” before investing in the musical performance. I won’t pay for tickets to anything using garbage PA amplification again. If I want to listen to a bar system, I’ll simply go to a bar. At least there it only costs a couple of beers.

You Saw It Here First!

If you have \$18,000 ready to invest in your audio system then you should consider the new B&W Matrix 800 loudspeakers. The picture is of a pair of them – standing six and a half feet high. Each uses two bass units, two Kevlar mid-range units, and a new 32mm gold metal tweeter. The 800s have all Matrix construction and have separate crossovers for each section for bi or tri-wiring capability.

Excuse the moiré patterns in the scanned image, it is unavoidable when scanning screened pictures. Come up and listen to ours when we get them in, but we need to sell a few more sets of 801s before we can afford them.



Now for Some B&Ws at a Lower Price

I need to get the Matrix 801s back on display because I have a few more ideas to play with regarding their crossover – such as a whole new board layout – assuming B&W doesn't do it first.

Thus, my demo Matrix Three Series Two speakers (absolutely perfect in new condition in the cartons with a new warranty) are for sale at a much reduced price. These light oak beauties list for \$2500/pair, we normally sell them at \$2250/pair, but right now, **my demo set is available for \$1750/pair** including shipping to you in the continental USA

The Matrix Three Series Two is a great loudspeaker (about 90% of the performance of the 801 at a vastly lower price). It has 90 dB sensitivity so it is easy to drive and only needs about 50 watts per channel but it is electronically protected so its hard to overpower it with a big amplifier. It is a high definition wide range speaker with excellent imaging capability and very good extended deep bass response

Like all modern B&W speakers, the highs are extended and honest. Thus B&Ws tend to sound harsh on bad electronics. The speakers are not harsh – they simply tell you that some electronics are. Thus some people have judged the B&Ws poorly because the speakers told them their electronics were not up to snuff. We recommend our Omega, Fet-Valve, or Super Pas Omega preamps with any of our power amps for running the Matrix Threes. Actually the Omega Control amp does an outstanding job too.

Want to save even more? Buy the Matrix Three speakers at the same time as you order two pieces of our electronics from us and take 10% off the electronics price too. Call us for other specials right now, such as the combination of DM560s and the Acoustitune woofers. We can set you up now with

Super Seventy Power Supply Upgrade

Because we have had a couple of field failures of the 800 volt rated 1N5408 power supply diodes in the new solid state power supply accompanying the AVA high current power transformer for the Dyna St-70, we have recently upgraded that solid state diode bridge to double its overvoltage capability.

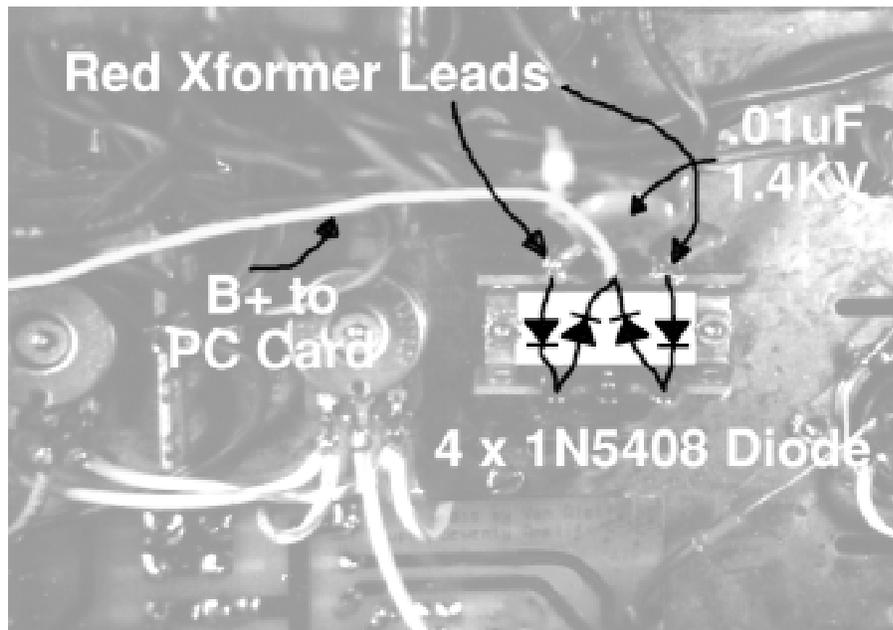
The problem seems to be caused by rare but real AC line voltage spikes way over the normal 120V line rating. If these spikes get significantly over the 800 volt rating of the power supply diodes, then they can fail, blowing a fuse and shutting down the amplifier until the diodes are replaced.

The cure is simple. We double the voltage rating by installing two of the diodes in series in each half of the bridge, with a .01 μ F at 1.4KV capacitor in parallel with the secondary transformer leads to help suppress overvoltage spikes.

The additional parts needed are two 1N5408 diodes, one .01 μ F at 1.4KV disc capacitor, and one more terminal strip identical to the one the supply is already mounted on.

To upgrade the supply look at the photograph-sketch herein and first remove your original two diodes. Install the additional

terminal strip with the same hardware used for the first terminal strip. Bend each terminal strip outward to make room for the diodes. Then install two diodes across the terminal strip pointing away from the red transformer leads. Install two more (one in series with each of the first two) so that the banded ends of the second two diodes are tied together at the terminal strip lug where the B+ lead feeds on to the PC card. Install the .01 μ F 1.4KV capacitor in parallel with the red transformer leads (one capacitor lead to each terminal strip lug where a red transformer lead is connected).



If you have purchased an AVA power transformer kit from us, we will supply the additional parts at no charge. Simply send us a copy of your sales slip and we will send you the two

diodes, the capacitor, and the terminal strip free of charge. We suggest you do it now to avoid blowing your power supply.

We also suggest that you acquire a good AC line filter to use with all your audio components. As we have mentioned in the past, low cost protection is available at any computer store or Radio Shack. Protect your system now. Summer lightning storms and air conditioner surges are coming.

Super Pas Three Power Supply Upgrade

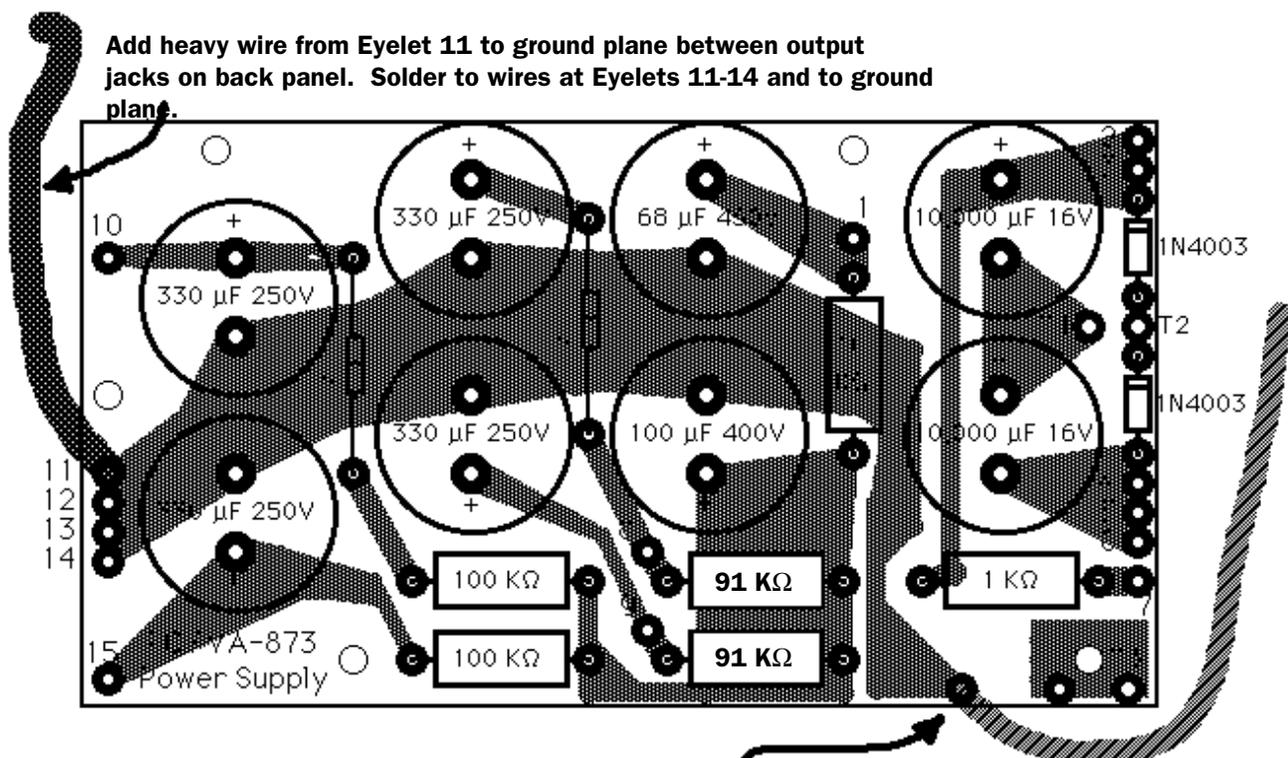
While completing the design work on the Omega output buffers for the Super Pas Three we discovered that the residual noise (hum level) of the preamp could be lowered usefully further by a simple change in the ground wiring of the unit.

The new Omega buffer circuits extend the bass response of the Super Pas Three so much and improve the definition so markedly that the residual hum level in the vacuum tube circuits that was not obvious before became slightly apparent. Thus we researched the cause of this hum, found the culprit, and eliminated it at its source, making the Super Pas Three (with or without the great new Omega buffers) much quieter. Because the cure was a simple refinement in the grounding arrangement, we are showing you how to do it to your own Super Pas Three now.

This is a relatively easy do-it-yourself project for any of you with Super Pas Three units who are handy with a solder gun. No additional parts from us are required. You will need about six inches of a heavy gauge (14 gauge to 18 gauge) stranded wire and the skill to follow these directions to avoid unwiring and removing the power supply board.

First discharge the unplugged preamp's power supply capacitors with a 300 ohm 2 watt resistor. Note that the resistor body will get hot during the discharge process. Next note if there is enough wire protruding up through the power supply card to solder a wire to at Eyelets 11-14. If not, you will have to remove the power supply board to accomplish this upgrade, a rather tedious task not described herein. If there is enough lead then proceed.

Locate the zero ohm resistor (tan body with centered black stripe) next to the red/yellow transformer lead tubular terminal at the right front of the power supply card. Cut the leads to this zero ohm jumper at the



Remove zero ohm jumper by cutting leads at the body. Move Red/Yellow transformer lead to zero ohm jumper lead as shown. Remove tubular terminal where Red/Yellow transformer lead was previously attached.

body, leaving as much lead as possible sticking up from the board. Locate the red/yellow transformer lead soldered to the tubular terminal at the right front corner of the power supply board. Unsolder this lead and move it to the zero ohm resistor "stub" indicated in the sketch on page four. Be very careful in soldering to not unsolder the zero ohm lead from the PC card. If it comes out you will need to remove the 5 mounting screws from the board and lift it enough to make a reliable solder connection here. If the red/yellow wire is too short to reach, add a terminal strip so that you can extend the length of the lead. The lead may already be "spliced" at a terminal strip on the back panel. If so, simply substitute a longer wire.

Now add a short heavy ground wire from the leads protruding at Eyelets 11-14 at the other end of the power supply board to the ground plane between the two audio output jacks. If your unit does not have our ground plane jack set, then solder the new ground lead to a wire between the ground lugs of the left and right output jacks.

On units without our ground plane jack set you should also add a solder lug to the inside of the back panel between the output jacks and solder the new ground wire to this lug too. This will insure that the back panel is really grounded. The new grounding arrangement provides a very short and very low impedance ground between the audio output ground and the power supply so that charge currents cannot generate a ripple signal on the ground return. The shorter and heavier the new ground wire is, the lower the residual hum will be. You should be able to push its level down to completely inaudible. We think you will find this simple project is well worth

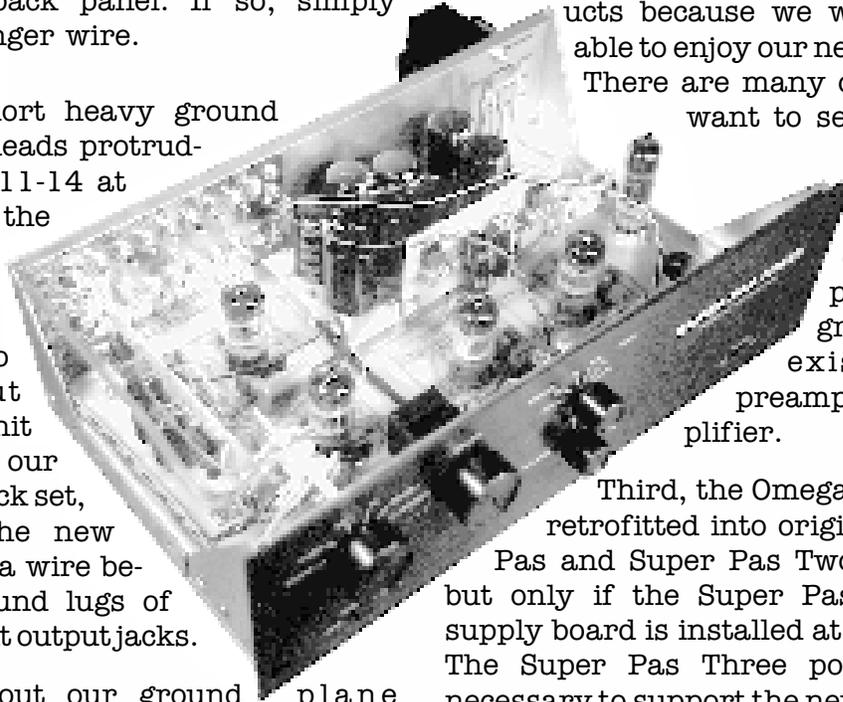
A Further Look at the Omega Circuits

First, we cannot over emphasize how musically natural and pure the new Omega circuits are. They make a huge improvement in your audio system and one you will appreciate instantly. These circuits really can be classified as a breakthrough in musicality at an affordable price. If you are not thinking about upgrading your system you are missing more than you know.

Second, we are offering the Omega circuits as low cost retrofits to nearly all of our earlier preamp and control amp products because we want you to be able to enjoy our newest creations.

There are many companies that want to sell you a set of interconnect cables that cost more than our Omega preamp upgrades for your existing AVA preamp or control amplifier.

Third, the Omega buffers can be retrofitted into original AVA Super Pas and Super Pas Two preamps too, but only if the Super Pas Three power supply board is installed at the same time. The Super Pas Three power supply is necessary to support the new Omega buffer circuits (both electrically and mechanically). Note that the installation of the Super Pas Three power supply includes the upgrade of the audio circuits to Super Pas Three status at no extra charge. These improvements will be made on your existing Super Pas audio boards. The Super Pas Three power supply upgrade (which includes relocating the power transformer to the outside of the back panel) is a \$195.00 project. Thus the total cost to install the Omega buffers and the Super Pas Three power supply in an older Super Pas preamp is \$390.00. The results are well worth the money. There simply isn't a more enjoy-



The Great Wire Challenge Concluded

I reported last month that we had actually received interconnect and speaker wire samples from one supplier and were promised samples from a second supplier. We waited as long as possible for the second samples to show up but they never did. Thus inasmuch as only one supplier has responded to our challenge issued herein in January, it is time to report on our findings. We regret we got so little response from the manufacturers. They all were certainly quick to sign that letter to *Audio* magazine.

Anyway, to make a long story very short, I am now using **Kimber Kables** in my own reference system. Why? Because I believe the system sounds slightly more musical with them than without them. The differences I think I hear are subtle – not at all day and night – and are not anything like the purple prose cable test write-ups in the underground magazines. I have real reservations about the cost-benefit ratio of the improvements (the retail price of all the cables I am using would nearly pay for a complete Fet-Valve 500 amplifier and that will make a really big improvement in your system - or if you have enough audio equipment already it would pay for a Sony 32HSR10 big screen TV – make your value judgements carefully). I also have reservations about the mechanical interface of the interconnect cables with the system. Finally, neither I nor the rest of my staff could pick out the cables on an A-B blind test (except for the marginally shielded KCAG types which we could pick out close to the woofer by noticing a bit more background hum). But, the bottom line is that when I put Kimber Kables everywhere in my system (from tuner to preamp, from my Fet-Valve CD player to its hybrid control box, from the control box to the preamp, from the preamp to the power amp, and finally from the power amp to my B&W and Acoustat loudspeakers) I think long term listening tells me the system is a tiny bit

sweeter, a bit clearer, and a bit purer. Since I got these samples for free, I am going to use them. But since they would cost you over \$1800.00 for all the cables I am now using I am not at all certain that they should be your first choice for an upgrade. But if you have everything else, then why not? They do seem to make a nice finishing touch to an already superior audio system.

It is possible that they are only sugar pills, but sometimes sugar pills taste pretty good. If you have the spare cash to play with, go ahead and experiment with cables - you may find something you like and **I would recommend that you experiment with Kimber Kables first** because they were the only company to respond to my challenge and because their cables certainly are built to high mechanical standards and because Ray Kimber, their president, is a really nice and rational person. I think you will be satisfied in doing business with his company because he is going to make sure that you are.

The First Evaluation Was at the Test Bench

We received two kinds of interconnect cables from Kimber. The interconnect cables are very well made with very sturdy RCA plugs. The outer barrels of the plugs are metal so you must take care to not let them touch together in some applications (such as at the inputs of a stock Dyna St-70 or at the chassis of Dyna 400 amplifiers) or possible hum causing ground loops could occur.

The lower cost (\$101.35/pair) interconnect set was their model KC1-2M, a 2 meter long blue cable consisting of four heavy insulated stranded conductors braided together inside a shielded sheath. One of the conductors was hot, the other three were the signal ground, and at one end of the cable (marked the preamp end) the shield was connected too. This cable measured about 268 pF total capacitance.

The premium interconnects were their \$650/pair KCAG 2 meter silver cables. These appeared to have the same physical construction as the others (with much more expensive materials of course), except there was no outer sheath or shield. This cable measured very low capacitance - 113 pF for 2 meters, but we could induct more hum into this cable than we could in either the blue Kimber Kables or Radio Shack cables by holding an AC power cord close to them - even with the cable ends shorted together. The increase in noise was not terrible, but it was observable. We would suggest you be very careful in using this cable in long runs near AC power lines. You may get lower noise with better shielded cables.

Our crusty old Radio Shack cables measured about 194 pF for 6 feet, halfway between the Kimbers. The capacitance readings tell us that you may induce an audible roll-off if you use the long versions of the blue Kimber Kables between a vacuum tube preamp and a power amp. The extra stray capacitance may roll off the highs and may also cause a vacuum tube preamp to current limit - increasing distortion. That could make a sound change you could hear, but that would not be very nice. The very low capacitance RCAG cables would be much more appropriate for the output of a vacuum tube preamp.

We noted that the Kimber Kable RCA plugs made **very firm** contact with our jacks (good) but that they may scrape into the finish layer on your jacks quicker if plugged in and unplugged many times (not so good but not likely to happen in a plug it in and forget it system). They did not deform the inner contacts in our RCA jacks as we have observed many "premium" cables to do. The blue cables were at the upper limits of stiffness that we are comfortable with. Cables this stiff can come loose if equipment is moved or adjusted on the shelf - but the very firm interface with the equipments' jacks make this unpleasant happening less likely.

We tested the cables dynamically with white noise and square waves feeding identical signals into one Kimber Kable and one Radio Shack cable and then setting the scope to invert and sum the two signals. If there was no difference at the output between the cables' ability to transmit an audio frequency signal, it should show up as a straight line on the scope. Any difference would generate an observable difference signal. We could not observe any difference signal on any of the interconnect cables within the resolution limits of our scope and within the band width limits of our square wave generator at any frequency close to audio. We did observe a slight high frequency roll-off on very high frequency (100 KHz and above) square waves on all the cables and that the roll-off was slightly less with the premium Kimber Kables. We saw no overshoot or ringing with any of the cables.

Kimber also supplied two kinds of speaker cable. The lower cost version was their \$1.00 per foot braided 8 conductor 4PR wire. It consisted of four brown and four black insulated stranded conductors braided together and terminated in bare wire ends. It measured about 1150 pF total capacitance for the 20 foot runs supplied. The higher cost Kimber Kables was their \$4.40 per foot braided 8 conductor 4TC wire. This has Teflon insulation and was supplied with dual stacking banana plugs - a very reliable and easy to use termination. The 4TC cables measured 1110 pF total capacitance for the same length. In comparison, our 18 gauge Radio Shack two conductor "zip cord" type speaker wire measures about 230 pF for 20 feet of cable - a figure we are more comfortable with for reasons discussed below.

We tested the cables dynamically as we had the interconnects, driving them from two channels of a Fet-Valve 500 amplifier carefully checked for identical channel performance (which all our amps have). We matched a Kimber Kable with a Radio

Shack cable into an 8 ohm load and measured the difference signal at the load. Again, neither on white noise nor on square waves could we detect any difference between the cables. Note that because our amplifiers will drive very large capacitive loads without ringing or slowing down, the extra capacitive load caused by the Kimber Kables was negated. With some marginally stable amplifiers, the extra stray capacitance might cause overshoot and ringing (and a "brighter" sound) or as a worse case, an oscillating and damaged amplifier. With our amplifier there was no overshoot or ringing at all with either the high capacitance Kimber Kables or the low capacitance Radio Shack cables. The higher resistance of the Radio Shack cables had no effect on the signal bandwidth or amplitude because the slightly higher resistance of the Radio Shack cable was still negligible in comparison to the 8 ohm load. You really don't need a heavy speaker wire unless you are running hundreds of feet of cable into a low impedance loudspeaker.

A-B Listening Gave Us No "Better" Results

We made our formal listening tests by installing the Kimber Kables in one channel of the system and Radio Shack cables in the other channel (first with interconnects only, then with speaker cables only, and finally with both). We used CD test disc generated white noise into a pair of very carefully matched B&W Matrix Three Series Two speakers making sure we listened exactly on axis to both speakers in my very dead evaluation room. We compared one channel to the other attempting to hear any difference between the speakers. Nobody could detect any differences. In comparison, moving the mid-range coil of a B&W 801 Matrix a few inches makes a huge and instantly observable difference. We listened to mono records and CDs with Kimber Kable from input to output on one channel. Nobody could hear any worthwhile musical differences between the two channels or could tell which channel had the "good wires." We tried again with the Acoustat electrostatics with the same results. We substituted our lowest priced

equipment for the all Fet-Valve system and there still was no difference between the channels we could hear under these test conditions (we could tell the Fet-Valve impact was missing though). All of the carefully conducted tests ended up telling us there was no useful difference between the Kimber Kables and the low cost cables we had been using.

Then Why Am I Using the Kimber Kable?

Because when all the formal tests were done I went ahead and installed the Kimber Kables from input to output of both channels of my reference system and went back to simply relax and listen to the music and that is when I started to "hear something" or more appropriately, "not hear something." Everything sounded the same, but everything sounded a tiny bit closer to live real music. Not all on my staff agree. Some think I am simply hearing the "sugar pill effect" of all those expensive cables being there. Others don't disagree with my very subjective evaluation. They remember that we designed some widely accepted audio equipment (the Dyna 416 - Double 400 for example) "by ear" long before we had full time electrical engineers on the staff and that the test bench and formal A-B testing doesn't give us all the answers (or always the right answer).

Maybe I am "hearing things" and certainly I would not want to pay as much for audio cables as these cost, but the Kimber Kables are staying in my system for now. They met my challenge fairly and surprised me by making my system seem to work that little bit better and in the quest for perfect music reproduction, each "little bit" counts.

Used Equipment Bargains!

Available for the first time right now, a great Transcendence 400 Series Two amplifier built into a Dyna 400 chassis with our own custom faceplate. The new price for this 200 watt per channel high current powerhouse was \$2400 in 1986. It is a Fet-Valve trade in and you can have it for just \$800.00. We have an Omega 101 preamp

too - my prototype with phono, tone controls, and a phase inverter all for \$350.00. This is a great sounding preamp in a full function chassis. Finally both Fet Three Plus 110s from last month are still available - price negotiable! Call us and make an offer.

Frank and Darlene Van Alstine