



audio

Cables: Audio Epistemology, Intuitive and Counter-Intuitive, Rachmaninoff, And My Grandmother

An Opinion by Max Duidious

Cable weirdness

It it's true, that "a little knowledge is a dangerous thing," then does it follow that "a lot of knowledge is confounding"? In my case, for sure!! How many times have you heard of some astronomer or other who has said, "The more we study the 'Origins Of The Universe,' the more we realize how much we don't know: The more we realize what we don't know, the more it brings us back to The Big Bang, or God." Playing around with cables has brought me to a similar epistemological stance toward electronics, or (merely) that portion of electronics that has to do with audio. I use the words "playing around" advisedly, because my search for truth is hardly scientific, or even systematic. I guess you might say that my quest for the holy grail of great sound has brought me to the hairy boundary between knowing and not knowing. And that has provided me with some insights I might share as I proceed on my path, which you might attend at your own risk.



Small Walker 1992

You'll have to trust me on a lot of this, get into my mindset, so I might as well take a moment to spell out my position and preferences. First, I am not trained in electronics, though I am an auto-didact (self-teacher) who relies on unsystematic readings, and conversations with my better-read buddies when dealing with assorted topics in audio as they become of interest to me. My electronics background is spotty, catch-as-catch-can, with more holes than cheese.

Secondly, since I don't really understand the ins and outs of sophisticated theory, some audio buddies have had to "coach" me, and they became my teachers. I have learned from some of the best (Walt Jung, Sid Smith, John Curl, each mostly an auto-didact, by the way) in conversation, and by reading their work, but I've never taken a course in electronics from any of the universities I've attended. I offer apologies in advance for my shortcomings.

Thirdly, as I don't truly understand much theory, I rely on a kind of built-in Occam's Razor. Briefly summarized, the Razor might be paraphrased as; "When hypotheses compete, the simplest is likeliest." Or, in audio; "Simpler is likelier." That's easy to remember. Of course it bears the additional corollary: "Beware of over-simplification!" Like the late, great Johnny Cash, I walk the line—the slack-wire between simple and too simple. I confess: I am not trained in electronics, I am self-taught with all the virtues and vices that implies, I understand only a little theory, and so I constantly tell myself, "Keep it simple, stupid, but not too simple." If you can take seriously anything written by such a fool, read on.

By now I suppose we've each heard of guys whose big-rig systems have been besieged by audio gremlins and goblins, how they've spent *mucho dinero* and untold hours trying to track down these demons and exorcize them, how they have had to bring in exorcists to check for ground loops, measure broadcast noise, etc.; other shaman to isolate, shield, and ground a dedicated line to their systems from their fuse box to keep Radio Frequency Interference (RFI) and Electro-Magnetic Interference (EMI) bled to ground. Others, unsatisfied with that level of rigor, have had their whole connection back to the pole in the back yard, isolated, shielded, and grounded. Heartbreakingly, after taking such pains, they were still met with various forms of crud that escaped unfiltered into their systems.

Could it be that the rest of their house wiring, made up of wires cut to various lengths, and exposed to whatever was being broadcast in the neighborhood, was acting as an antenna? That even if they did the perfectionist treatment, somehow (don't ask me how) the whole house was creating a field that trapped RFI (broadcast) and EMI (household appliance motors, computers) from which there was no escape? That the smaller, shorter, interconnects, speaker cables, AC cords, *phono cartridge leads*, were also acting as antennae? Or that this force field with ever shorter wavelengths, was generating audio crud and penetrating our human bodies and stimulating our audio nerves as we sleep—just kidding—and after a while, some guys have figured that their houses stood in the path of all the commercial radio station broadcast towers, the taxis and marine band stuff, the health care and banking microwave transmitters, VHF and UHF TV broadcasts, and they have sold out and moved to another neighborhood, or town. No sacrifice is too great for a knight on the quest!

Conversely, we all have heard by now of some guy who did something completely against the canon of acceptable practice, and his particular set of gremlins went away. This guy might have floated the ground on his big-rig system, for example. Well, how can you bleed the RFI and EMI to ground if there is no ground? And the answer is, "Duh. I dunno." Meaning, well here we are back to the boundary of what we know and don't know, again.

Some of the best interconnects I've ever heard are those made by Ed Meitner, at EMM Labs. He has designed a system utilizing a good cable (metallurgically and dielectrically up to date, with a separate—spiral wrapped—antenna to ground), and it is used in a number of recording studios. There are a lot of commercial products out in the world competing for the prestige that goes with having wired recording studios, studios that are housed in buildings from crowded mid-town Manhattan, to bucolic settings away from the buzzing city's constant noise. These recording studios are beset with a host of varying interferences and ground schemes. Some labels, like DMP, use a shielded and grounded interconnect, like Ed Meitner's EMM Crypton Solid Copper, while other labels, like Chesky, use a common four-twist microphone cable (equally sophisticated metallurgically and dielectrically), like various Canare Cables, and float the ground.

Now I'll be a monkey's uncle, but these two differing cables can do the job equally well, as each record label's best efforts demonstrate. Somehow, because of variables I just don't understand, the unshielded cables reject the various ground loop noise, hum, RFI and EMI just fine. I invite anyone,

who thinks he knows and cares enough, to send in a letter to the editor with an explanation. Remember, the Positive Feedback Online community has many experts, credentialed and un-, just waiting in the tall grass for frivolous letters.

Synergies

While reviewing Parasound's Halo JC-1s, I tried to pull out all the stops in giving them a chance to sound their optimum. This meant using my best front end: the recently refurbished V.P.I. HW-IV turntable, Souther Tri-Quartz linear tracking tone arm, Grado low output Statement Cartridge, with a "Black Cube" phono stage for playing LPs, Marantz's SA 8260 SACD multi-channel player (top-rated: see Max Dudious' "My Marantz" PFO Issue 6 at www.positive-feedback.com/Issue6/marantz.htm) for playing CDs, and my heavily Pooged Levinson JC-2 pre-amp (some call it "next-best to the Blowtorch."), my much-Pooged Dynaudio Consequence speakers (New Goertz Alpha Core foil inductor based X-overs, some Scan-Speak and some Morel drivers), my lightly Pooged Shadow Electronic Crossover (latest chipset from Intel), and my medium Pooged dedicated bass amp (Adcom 555).

While reviewing the Parasound Halo's JC-1 amps, I tried them with some Cardas best interconnects and they were a tad laid-back. Then I tried the Goertz tri Q silver interconnects, but they were a tad up-front. Then I tried the Goertz Alpha-Core "micro-purl" copper interconnects (I call them "Cousin Minnie Pearls") which were fine, and Ed Meitner's interconnects were also fine, but I found *the sound I liked with these amps* came from the little known "Reference Quest" interconnects, made by Twisted Pair Designs. These had won a previous informal shoot-out with a handful of generic types made by me, and others made by Kevin Haskins of DIY cables, with some others my pal Dr. Ijaz Khan brought 'round. (For more information on Twisted Pair see www.twisted-pair-design.com.) The "Reference Quest" cables are made with two solid silver conductors and a stranded copper return, and use polyethylene insulation. They feature RCA plugs made with gold directly plated to copper alloy (without the often intervening nickel layer, much like the female Vampire jacks used in the JC-1 amps). The designer is Art Almstead, formerly of IBM, whose work suggests he's a guy who knows more than a little about what's what. The fit and finish of these "Reference Quest" cables is particularly nice, and the sound is very detailed with a perspective that features the suave balance of not too forward, but neither too laid-back for my taste. The choice of name suggests that Twisted Pair considers the audio quest the same way that most of us do: a quest worth being on.

About dem power cables...

Similarly, with the AC cords. I had a handful of high-current AC lines around the house: some generics, a pair that came with the Parasound 3500 (Black jacket), a pair (Grey jacket) that came with the Parasound JC-1's that Crump dubbed "not bad," a pair made by Kevin Haskins to an early Crump design that Haskins said were better than most that factories provide, a pair by Twisted Pair Designs also designed by Art Almstead, and, later, a pair of T.G. Audio Lab's SLVR-F's designed by Bob Crump. With a couple of my audio buddies, we compared these various AC cords. First we compared the Parasound Blacks to the DIY Bob Crump design. The Parasound Blacks were notably murkier than the older Crump design (Haskins' least expensive). Then we played the older Crumps against the Parasound Greys (jacket color). The Greys had better sound in the presence region (around 2 k - 4 kHz, or similar to tinkling keys). When compared to the Twisted Pair Designs (TPDs) the Greys seemed to have a tad more exaggerated sibilance and less crisp, clean highs; while the TPDs seemed to have a cleaner over-all sound, with bright, but not unduly zippy, upper-mids and trebles we call "presence."

When I told Art Almstead the result of our listening "test," he was pleased and suggested the working hypothesis that good AC cords might not depend on the metals chosen (copper or silver), or the dielectric of the insulation (polyethylene, polypropylene, or even teflon), but on the shielding scheme which bleeds RFI and EMI to ground. He thought the hypothesis might make the basis for a good experiment. Based on this small sample test, he may be right. Almstead claims he's tested his AC cords on computer monitors, some of the larger ones most sensitive to "snow" or "noise." Usually, the visually cleanest have audibly cleanest sound in listening tests, but that relationship varies with the sophistication of the ground scheme for the whole audio system. That is, your mileage may vary. He suggests the AC cords for computer monitors (marked "shielded"), available on the cheap at computer stores and Radio Shack, might do as well as most "audiophile" cords for low-current applications (CD players, tuners, pre-amps). I've tried some \$3.95 computer AC cords on my CD players, and this suggestion is worth considering. It's an inexpensive way to test your system's factory AC cords. In my limited experience, the highs do clean up a notch with computer AC cords, as

compared with factory cords. But, for high-current amps, there is nothing available through computer supply stores that will do. Not surprisingly, Art Almstead makes an AC cord that is notably clean and keeps the sibilance region under good control.

Listening tests—and Rachmaninoff

With Twisted Pair Design's interconnects and AC cords, I set about my listening tests. One of my favorite pieces with which to evaluate amplifiers or loudspeakers is Rachmaninoff's *Symphonic Dances*, his most mature work. I have four versions in house: there were more but my daughters each walked off with one. The 1967 recording by the Dallas Symphony Orchestra, Donald Johanos, conductor (Turnabout TV 341458), is a bit on the thin side orchestrally speaking, or it may be the result of a then experimental recording technique (ribbon microphones) that didn't do the work justice. The performance is vibrant, though, enough to make the LP a longtime favorite with many audiophiles. A 1984 reading by the Novosibirsk Philharmonic Orchestra, Arnold Kaz, conductor (Sony SMK 57 660) has great panache, but a somewhat nasal acoustic I can't account for. The (also 1984) reading by the Concertgebouw Orchestra, Vladimir Ashkenazy conducting, (London 430 733-2) was my favorite for a long while. It seemed to be one of those rare early recordings where the performance delivered on the promise of digital sound (great timbral balance and dynamic range) with few, if any, of digital's annoying traits (edginess, harshness). But the 1994 reading by the Baltimore Symphony Orchestra, David Zinman conductor, (Telarc CD-80331), transcended all those with a more subtle performance and the excellent audio engineering for which Telarc has, quite rightly, become famous.

The Zinman recording now appears on many critics' choice lists, and if I could have only one representative sample of Rachmaninoff's work, this would be the one. Not one to gild the lily, Zinman conducts with great restraint this overtly romantic work, which, without such discipline as he brings to it, often gushes over the edge from an organically whole piece of music, into a maudlin series of emotional effects and *memento mori*. Where others might emphasize each section as a "dance," Zinman plays each as a movement in a symphony. He shares the view, held by many, that the work is sufficiently symphonic in scope to be thought of as Rachmaninoff's "Fourth Symphony." I concur.

There are places in the score where, familiar as it is, I heard some things as if for the first time through the JC-1 amplifiers. The characteristic acoustic (bright and analytic, or warm and forgiving) of the various halls was distinct; the decay and reverberation characteristics separated out Amsterdam's more romantic Concertgebouw (longer decay) from Baltimore's more neo-classical sounding Meyerhoff Hall (shorter decay). Each of these two halls sounds as it does in real life, if my (damn) memory isn't playing tricks on me. This means the JC-1 amplifiers do not "ring" or "smear" the sound resulting in all halls sounding more alike than different. Each hall has its distinct voice. This is a good example of the amps getting out of the audio system's way, in service of the music.

One particular example comes in the first movement, in the little crescendo that leads up to the first serious bass drum clap, where there is a lot of activity in the trebles. The cymbals, the tambourine, and the triangle all get going at once as the orchestra is rising to a *tutti*. Through the JC-1 amps I can make out not only that they are playing, where they stand (center left) at the rear of the orchestra, but even when momentarily the triangle is silent for a few bars and then rejoins the orchestra, though the tambourine and cymbals are active. I've never heard that done with such clarity, spatial definition, and timbral accuracy before. I guess this is an example of the gear letting the listener hear further into the recording. Not that I go around only listening for cymbals, tambourines, and triangles all the time, mind you—but this example separates the "very good" from the "excellent."

And just when I thought I had figured out all the subtleties of the AC cords and how they affected my system's amps, Bob Crump sent me a pair of his "best" SLVR-F Power Cords, to show how the JC-1s ought to sound according to his "golden ears." And jumpin' Jack Flash, the backgrounds got quieter, and the overall sound got less bright, each by a noticeable notch.

The two camps

It seems the argument between the two camps had crystallized in the AC cords that supplied current to my JC-1 amplifiers. There are those who would argue AC cords should follow the recent developments in interconnects and speaker cables. There the softer metals, Ohno-cast six-nines purity Copper and jewelry-quality Silver, should be used; the "lay" of the windings should be roped to cancel each other's field; the woven "hum shield" should be braided over aluminum-mylar and grounded at one end to act as an RFI/EMI antenna whose signal would then be bled to ground; and

the insulation should be chosen (as with signal path capacitors) to minimize "smearing" and maximize propagation velocity. The ideal AC cable should, as much as possible, resemble an interconnect, only be bigger, fatter, and capable of handling more current.

The contras would argue that AC cords follow their own rules that are counter-intuitive to recent developments in interconnects and speaker cables. The trick, they would argue, is to "slow down" the propagation velocity by using regular, less than noble metals, such as coating the copper conductors with tin; to employ insulation like Poly Vinyl Chloride (PVC) that has high capacitance value to roll off the super-sonic high frequencies that are riding on the AC; to ignore the "hum shield" and float the ground leaving the signal ground out of touch with the chassis ground. These steps might succeed in trapping and rolling off all the RFI and EMI rather than using parts (like capacitors or resistors) in a filter network, or bleed-to-ground schemes.

The result of the counter-intuitive AC cable might be characterized subjectively as having the partial tones that describe the "whiskers" on the flute further down in the mix such that the metallic flute tones move a little toward the wooden tones of the recorder. These tones are more like the pure sine waves produced by a signal generator. The flute is still very much a flute, but its whiskers are not as pronounced. Similarly, the solo violin is still a violin, but the bowing and scraping are not as pronounced.

The Art Almstead designed Twisted Pair AC cord sounds a tad more forward in the presence region than the Bob Crump designed T.G. Audio Lab's SLVR-F AC cord. They sound very similar with regard to most parameters. In my room, with my gear, listening to classical music, I'd swear I hear a tad more ambiance, get more of a sense of the original room acoustic, through Crump's. Listening to rock and jazz through Almstead's I'd swear I hear a tad more presence, the resin on the bow, the spit in the reed of the saxophone, the whiskers on the flute, the rivets on the sizzle cymbal.

The epistemological problem...

Which brings me back to the scary edge between what we know, and what we don't know.

If all the features of the model currently in favor (appropriate metals, dielectrics, shielding schemes, and bleed to ground placement) are followed and we get bad results such as RFI and EMI still getting through, or if all the features of that model are inverted (in favor of ignoble metals, hi Q or high electron storing insulation, and ground floated) and we get good results, then we just don't know what makes a good AC cord. It may be that the intuitively correct cord works best in certain applications, and the counter-intuitive cord works best in others. That might tell us something if we could only identify the pertinent variables and develop an acceptable experimental protocol. At the moment, I know of no one taking on this task. So I follow the old saw, "Not knowing if I knew, or if I knew not, I concluded I knew not." That is to say, if I'm not damn sure I understand, I probably don't. Of course there are those following that rule who still conclude the Earth is flat.

About now I think I'll tell you about a conversation I had with my grandmother, Nana. One day, while I was in school, we were sitting around watching TV and she said to me:

"Now that you're in college, Maxie, please explain to me how electricity works."

"Like what? Like a toaster?" I replied.

"That'll do, Max." she said.

So I explained how a hydro-electric dynamo generated current, with rotors and stators, and she didn't flinch. She nodded, like she understood. And then I explained how there were pumping stations that sent the current from the dam down the high-tension wires to transformers, and how those routed the current to the smaller transformers in the back of her apartment complex. And she gave me a knowing look. I went on about how the wires brought the current inside her building, through her electric meter, and to her kitchen and the plug on the wall. And again, she nodded. And how the electric current came into her kitchen by the little electrons bumping into each other inside the wire. I could see she'd been through all this with my uncles and was testing me.

"And when we plug the toaster into the outlet on the wall, we get current to the toaster that uses it to produce heat, Nana."

"And if we don't put a plug in the wall, Mr. Smartie, then what? Then what?" I was steeling myself for a trick question.

"I'll tell you what. If we don't put a plug in the wall, all the dirty little electrons fall out onto my floor, Max. And they make my floor so dirty that once a week I have to scrub it. Right now we're walking around ankle-deep in electrons!"

Well, I feel sort of like that. Where do the little electrons go that are not grounded to the third pin on my hospital grade AC plug? Do they just run back to the chassis of the amplifier, and dribble out into the room? Or do they bang around the interface between the copper filament and its tin coating, tiring themselves out and dissipating their energy as heat in amounts hardly large enough to measure? And all this activity at so high a frequency it is filtered out in the PVC insulation? Anyone with a clue on this might write a letter to the editor.

The (intuitional or counter-intuitional) cable for you might depend on the type of music you prefer to listen to, and how you like it to sound; or the room you listen in and if it is too lively or too damped; or the sound of your speakers, or your electronics. There may be no universal, one-size-fits-all, AC cord. I do know most AC cords provided by the manufacturers are O.K., but not great. Built to make a price point they can usually be improved upon. How to go about that is a matter of juggling all these variables. That there are so many AC cords on the market suggests there are a lot of combinations that work well enough. Hospital grade three prong plugs and IEC connectors are not only good fire insurance if you listen in an oxygen-rich room, they do clean up the sound a tad (I'll swear to that). And longer contact tines in some IEC connectors are likewise audible as they minimize arcing or dioding. Like everything else in this nutty world, there is no end of possible combinations, and there is no end of expense. You'd have to compute your own personal value system, and your bank balance into the equation.

I should add, my system benefits from a dedicated, shielded and grounded line to my fusebox, plus the Monster Automatic Voltage Stabilizer, AVS 2000, and the Monster Home Theater Reference PowerCenter©, HTS 7000. These two pieces really take nearly all of the crud out of my AC, and allow me to hear the differences between the various manufacturers AC cords I've mentioned in this little essay. Without them, or their equivalents, you may not be hearing your AC cords. But the AC cords themselves may still act as antennae. In this instance, if you like the refinement of having an antenna that also traps and filters out most of the remaining sizzle, you might consider the AC cords like those discussed above. One of them might optimize your system in your room.

Some folks might say this is *unimportant* minutiae: I say, this is the *most important* minutiae. Ask anyone who's been a serious collector, or historian, or genealogist. The small things are often the most important. Is your IEC connector made of brass, or copper alloy, or gold plated directly to copper alloy? It matters. Well, to me. I can hear the difference. You could, if you put your mind to it. It matters. Just like having a sparkling kitchen floor, so clean you could do surgery on it, mattered to my Nana. So now you might see how playing around with AC cords made me think of Rachmaninoff's *Symphonic Dances*, my grandmother, and audio epistemology, or how we're always insecure about how we can be sure about what we think we know.



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