

On Solid Ground: CAD Ground Control GC1 and Ground Control GC3

by Roy Gregory, April 24, 2017

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Back in May of 2016, I wrote about the Entreq products -- parallel clean grounds of singular performance and, shall we say, distinctive appearance. I was as impressed by their sonic impact as I was dismayed by the way they looked, the substantial timber boxes all wood grain and rounded edges, a stark contrast from the clean, high-tech lines of most of the audio equipment they are designed to be used with.

Since then, I've been looking for something that performs the same function at least as well and in a more attractive package. Well, it looks like I've found it. Computer Audio Design (CAD for short) is best known for two things: the 1543 Mk II DAC and the consistently excellent sound the company makes at shows. This reached its apogee at the Munich High End show last year, where they shared a room with Analogue Audio

Engineering and Boenicke Audio. Whilst I wasn't exactly surprised to hear great music in this room, I wasn't prepared for just how great, which is when I spied those extra, apparently featureless, almost square-section boxes nestling on the rack. Power supplies? New, smaller DACs? No, as I immediately suspected, these were clean-ground boxes, the first public showing for the Ground Control GC1.

Computer Audio Design, as the name suggests, is primarily focussed on file replay. The problem with this is that file replay means introducing a computer (of some sort) into your system, and computer designers are rather less than fastidious when it comes to controlling the electronically anti-social behavior of their products. Rather like a dog with an irresponsible or absent owner, the plethora of laptops and desktops, servers and NAS drives that litter our homes are notoriously indiscriminate



when it comes to dumping muck back into the AC supply -- and is that the animal you want to introduce to your sensitive, cosseted audio components? When Linn first introduced the original Lingo supply for the LP12, it received a lot of pushback from dealers, customers and the press, all claiming it made the 'table sound worse. In fact, that wasn't the case, but the Lingo's switch-mode power supply was polluting the mains and making the rest of the system sound worse. It's a salutary tale and one we'd do well to keep in mind, given just how many basic, switch-mode supplies are used in computer-based products -- products that are in many cases cutting corners to save cost in a super-competitive market.

This is a problem that CAD is only too well aware of -- and that the GC1 was developed specifically to counter. Housed in a simple, clean chassis that matches the other CAD components for height, it had a couple of banana sockets on the rear panel and a logo on the front. Otherwise it was about as featureless as a black box can

get -- but its impact on the system was anything but anonymous, even (or perhaps especially) under show conditions, where simply disconnecting one of the ground wires linking the GC1s to the transport or DAC resulted in an increase in grain and noise, along with the consequent loss of focus, background blackness, dynamic range and instrumental color. Impressive stuff, but what got me really excited was the prototype of a three-times-the-size unit, sitting atop and connected to the system's AC distribution block. Now, a few months later, I have both multiple GC1s and a GC3 in my system at home and the results were everything I hoped for -- and more.

Those snappy-looking boxes, with their nice sharp edges and soft black finish, are actually machined out of acrylic, an inset rear panel allowing access, carrying the sockets and keeping the appearance fixing-free. But as svelte as they look, these are no lightweights. Indeed, they're heavier -- much heavier -- than you expect, a function of the proprietary composite sandwich -- a conductive high-frequency absorber and mechanical damper -- that is specially produced for CAD. Although entirely passive in nature, it's this that makes the GC1 and GC3 so astonishingly effective, although that's only part of the story. The other half is the ground wire that connects the units to your system's components. Right about now you are probably thinking, *Ground wire? Can't you just use*

any old wire? Well, in the world of high-end audio, everything makes a difference, and in this case it's a difference that is both easily heard and easy to understand. After all, what you are trying to do is create a low-impedance exit path for noise in the system, so both the integrity of the connections to the component and the wire, as well as the wire itself, will make a significant difference to performance.



assumption that the smaller GC1 is broadly equivalent to the Minimus, making it look like an expensive option, so let's get the price/performance question out of the way. The CAD GC1 will set you back \$1850 (including a ground cable of your choice), while the triple-capacity Ground Control GC3 costs \$4500. Additional ground cables will set you back \$300 each. In price terms, this all makes the smaller GC1 broadly equivalent to the larger Silver Tellus with a good ground cable -- but for my money the CAD unit scores higher in terms of practicality and performance, making it the better option. Add to the fact that it's way, way prettier (okay, I know that beauty is in the eye of the beholder, but c'mon, really?) and it starts to look and sound like the clear best buy -- and that's before you start entering the big leagues with the GC3.



With any emergent product category, there's always a problem with setting a new unit in context. It was Entreq that really did the ground work (no pun intended) on this critical aspect of system performance, so, to a large extent, their products have established the market landscape with little boxes (the Minimus), big boxes (the Tellus), two levels of performance (copper or silver) and no fewer than six levels of copper and silver ground cables, with ascending levels of performance -- and of course, price.

CAD also offers a small box, a large box and ground cables, but there the similarities end. The GC1 and GC3 exist in one form only and CAD only offers a single type of cable, but they do offer a whole host of connectors and include a ground wire of your choice with each GC. That helps offset the apparently higher price of the CAD boxes when compared to the Entreq, where the cables are an add-on cost that can approach the cost of the grounding boxes themselves.

Even so, the suggestive symmetry between the two product lines can still mislead, it being perhaps a natural

So just what do the Ground Controls do for your system -- and perhaps more importantly, how should you deploy them? In performance terms that answer is simple: they kill noise. In musical terms, it's a little more complex -- and a lot more dramatic. But it also depends on how you use the unit(s) in your particular setup. Depending on variables such as the equipment you use, their grounding arrangements and the grounding arrangements (and quality) of your system's AC supply, the priorities might change, but two things will always remain true: you'll always hear a benefit (it's just a question of how big that benefit is) and experimentation is simplicity itself.

Let's start with the easiest and most affordable option -- a single GC1. The variety of CAD ground-wire terminations means that it is easy to start out with the obvious options -- normally a spade or AC plug, an RCA or XLR, depending on whether your system is balanced or single-ended, and a USB if you use a computer source. The other end will always have a lightweight banana plug to insert into the GC1's socket, a solution that's simple, secure (meaning that it doesn't loosen the way binding posts can) and ensures the largest possible contact area. Simply connect the GC1 to various points in the system, leave it for a minute

or two to settle and then take a listen. Once you've decided where it is most effective, then keep the appropriate cable.

Although the GC1 was designed to soak up the effluent output of digital sources and computers in particular, it quickly becomes apparent that its application extends well beyond that limited role.

The golden rule is, *Look for the noisiest/dirtiest element in your system and connect it there.*

Digital components are an obvious target, but they're not necessarily the only ones. The other really serious source of noise in your system is the AC supply itself, an increasingly polluted source of power. If you are using a star-grounded distribution block with a ground terminal,

then connecting that terminal to the GC1 can prove revelatory. Of course, it depends a little on how your system's AC supply is configured: for instance, whether you connect digital and analog components to the same ground bus or separate them. In the latter instance, the distribution block feeding the digital side of the system is the most likely place to start, but that's far from a certainty, so try both options. With a single GC1, it's incredibly easy to hear the effect and decide on the preferred position.

What are you going to hear?

A substantial drop in the noise floor, which in musical terms has a pretty profound effect. The most immediately obvious difference is an increase in dynamic range and musical "jump" -- the speed with which the instruments respond to input and especially changes in level. The background gets blacker and separation and clarity both improve, along with instrumental texture, color and character. What is less obvious is that these things bring an increased sense of rhythmic precision and articulation in the playing. You can simply hear more clearly where each



note starts (and stops) and how it relates to the other notes around it. Phrasing becomes more explicit, there's greater dramatic contrast in the performance, and the sense of ensemble playing, of musicians playing together with a single, expressive goal, increases significantly.

In broad musical terms, the musical performance gains presence and immediacy, emotional and dramatic impact. It sounds more like people playing, and they sound like better musicians.



If you think that sounds like a pretty fundamental improvement, you'd be right, because the GC1 acts at the very foundation of system performance. Noise is the enemy. The less noise there is, the more music you hear. But noise can take more than one form. It can be extraneous to the signal, or it can be part of the signal itself, just not where it should be. By lowering the noise floor, the GC1 doesn't just increase resolution of information; it increases temporal clarity too, making it easier to hear not just who is playing what, but when -- to a surprising degree. Plug the GC1 into your system -- whether to an unused

digital output on your DAC/CD player or the ground terminal on your distribution block -- and if you've never played with a ground block

before you are in for a shock. But be prepared, because once you've come to terms with the results of a single GC1, it's going to dawn on you that not only can you apply multiple ground blocks at different points in the system, but that the results are cumulative and complementary.



Look at the back of the GC1 and you'll see two sockets. That's not so that you can attach two ground wires to two different points (although attaching two to the same component can produce a subtle benefit). It's so you can daisy-chain more than one GC1 together, increasing its capacity. It was playing with GC1s in this

way, especially when connected to the ground post on an AC distribution block, that led to the creation of the “three times the capacity for twice the money” GC3, in an attempt to offer a more cost-effective high-capacity option. With one GC3 and three GC1s on hand, as well as a veritable cornucopia of connection options, I was able to really ring the changes, adding or subtracting the units, distributing them or daisy-chaining them together. What emerged was a clear hierarchy of application -- at least in the system in question. This consisted of the Wadia S7i CD player, Kuzma Stabi M/4Point and Lyra Etna, Connoisseur 4.2 PLE, and VTL TL-7.5 III and Siegfried II monoblocks, feeding Vienna Acoustics The Music speakers. The whole system was wired with Nordost Odin 2 and connected to a Quantum QRT QB8 distribution block.

I’m not going to step through each and every permutation, just the ones that worked. In this setup, the most effective use of a single GC1 was connected to the ground post of the QB8, with a second one best deployed on the digital output of the Wadia CD player. But things took a huge step forward when we upgraded the Ground Control connected to the QB8 from a GC1 to the GC3.

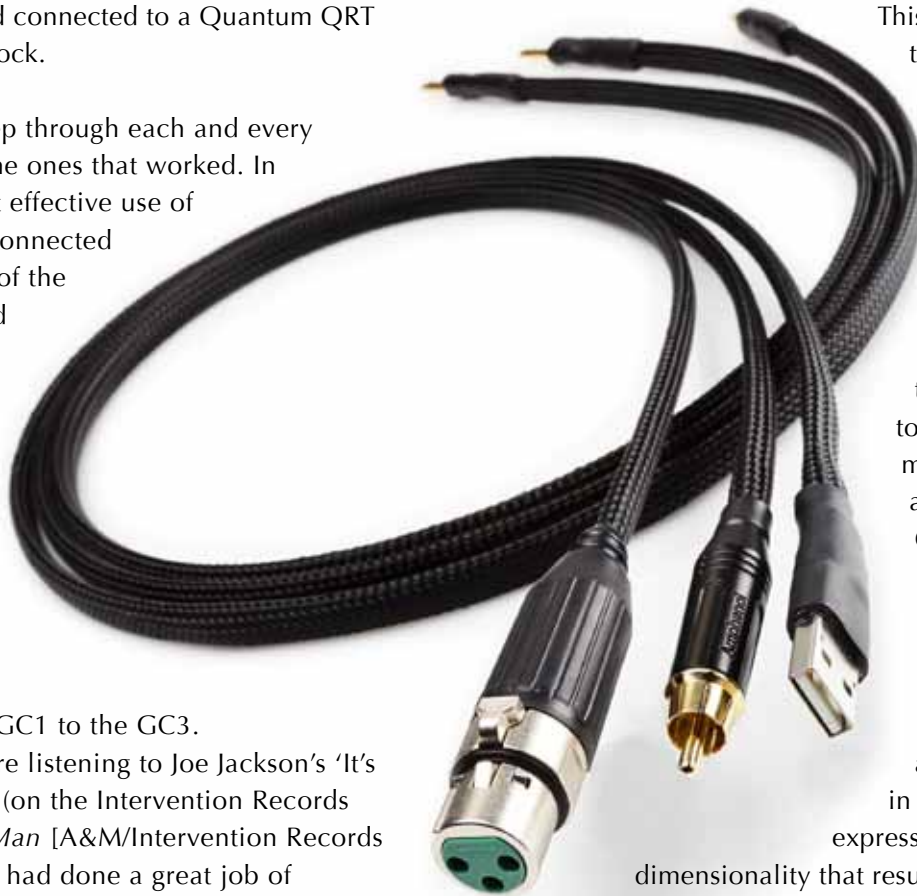
At the time, we were listening to Joe Jackson’s ‘It’s Different For Girls’ (on the Intervention Records reissue of *I’m The Man* [A&M/Intervention Records IR-004]). The GC1s had done a great job of extending and cleaning up the characteristic bass line, sorting the drums and separating out the band, but the GC3 transformed the presentation. Yes, the bass went deeper, but suddenly it had solidity and presence that added real drive to the track, while Jackson’s vocal finally freed itself from the rear of the stage, stepping forward, gaining clarity and articulation. This was the difference between listening to a recording and the band beginning to emerge in the listening room.

Adding a second GC1 to one of the main outputs on the TL-7.5 III line stage added texture, color and attack to the proceedings. The bass notes took on shape and purpose, bringing a feeling of natural pace and



progression to the line, while the expressive range and nuance on the vocal increased significantly. Adding the final GC1 on the ground post of the phono stage really was the icing on the cake, binding everything together into a single, coherent, easy, breathing whole.

Now the band really was in the room, Graham Maby’s bass became a tactile, mobile physicality, and the drums had real weight, volume and impact, but it was the central relationship between Jackson’s voice and the sparse, previously almost aimless guitar stabs that really locked in and brought things together. Jackson’s familiar voice became at once more recognizable and more affecting, the song much more effective.



This was a common theme across genres and formats. In just the same way that the GC1 on the CD player improved the sound of record replay, the converse was also true. Adding the GC1 to the phono stage might not have made as big a difference to CD replay as the one on the Wadia, but that doesn’t mean that it wasn’t just as important. Indeed, the subtle inflexions and articulation in the playing, the expressive nuance and

dimensionality that resulted from that final GC1, brought to mind the same clarity of purpose and spatial and temporal coherence that come with the last piece of a coherent cable loom. It’s not that everything has a place and everything is in its place; it’s that everything is so much easier to hear. What all the GCs had in common, used singly or in concert, was a velvety blackness to the musical background and natural, expressive quality -- more human, if you will -- that differentiates them from the competition. The best of the Entreq components hint at this, but with the CAD units it is the given on which everything else rests. I suspect it’s down to the specifics of the materials/technology employed, but whether that’s correct or not, I like the effect.

It didn't matter which source we played, or whether the material was small or large, jazz, classical, pop or punk rock, the result was always the same: the system stepped back and the performers and their performance stepped forward -- not physically, but in terms of immediacy, presence and accessibility. There was more grace, more grunt, more spit, more snarl, more attitude, more technical dexterity or virtuosity -- seemingly on demand. It didn't matter whether it was the Joe Jackson band or the Chicago Symphony, they sounded like better musicians on a better day. That's no small difference. More importantly, it's exactly the sort of difference we *should* be seeking. Now, consider this:



the system is connected to a dedicated AC supply and already has its own clean ground posts located in the yard. The substation is immediately across the road and the locale is semi-rural. That's about as good as domestic AC gets. And *still* the CAD Ground Controls made a really significant difference to the musical performance of the system.

Tot up three GC1s and a GC3 and the total comes in at a little over \$10,000. That's not exactly small beer, but then the benefits are not exactly small either, and in the context of this system (which tots up to well the wrong side of £100,000 plus cables and the HRS RXR rack) the degree of improvement is both shocking and a bargain. You'll note that I separated out both the cables and the rack from the system cost. Just like the Ground Control units, they're "passive components" that are often treated as an afterthought. Just like the GCs, they are capable of fundamentally improving system performance, constituting the foundation on which the active electronics depend. Indeed, neglect your cable, support or AC strategy and you'll be undermining whatever performance your electronics and speakers might be capable of. So, you should file the CAD Ground Controls alongside a coherent approach to AC/signal cabling and a properly considered support strategy as essential for serious system performance -- almost irrespective of system cost. I might have used a pricey rig for the review, but I employed the GCs in more modest setups too, where they proved just as effective.

I'd rate ground quality as the most overlooked arbiter of system performance -- and its absence as amongst the most insidious of influences. The CAD Ground Control units are demonstrably effective, neat and easy to work with. They will significantly improve just about any serious system, but their real beauty is that the more compromised the AC and grounding installation, the greater the potential improvement they represent. I consider them indispensable.

