

## Upgrading Your Hi Fi System (Part 3)

by  
Steve Dickinson

In part 2 of this series, I described the sort of benefits I've experienced when upgrading the mains and cables in my system. I explained how it can bring a system to life, adding vitality, energy and excitement. But I ended on a note of caution, because it can also make your system sound worse than it did before you started; it shouts where it should be singing, or the acoustic space may sound more reverberant and muddled. Vocals can be less intelligible, lyrics slurred and mumbled; instruments might develop a harsh or unsatisfying tone.

Naturally, when this happens people blame the cables, which were the last thing they changed. This is quite logical, but it's also a common mistake. It confuses cause with effect.

Upgrading the mains and cables is all about getting the energy of the musical performance off the disc and into the room. It's about increasing the capacity of the equipment to generate that energy, and reducing the system's tendency to dissipate that energy in losses. The net result is more energy output from the loudspeakers, which is great, because that's what we're paying for. But, as I recall vividly from an enlightening session at The AudioWorks a few years back, it is entirely possible to have too much of a good thing. Sometimes, that energy just seems to get in its own way.

Conventional wisdom has it that hifi equipment is microphonic. That is to say, the equipment acts like a microphone in turning sound energy into electrical signal. Some equipment is more microphonic than others, valves are often cited as a particular problem, but it is helpful to keep in mind that any moving electrical conductor, in the presence of a magnetic field, will generate an electrical current. That is as true of the windings of a dynamo as it is of the tiny vibrations of an electrical component subject to the Earth's magnetic field. It's simply a matter of degree. But don't forget that most hifi equipment is subject to a considerably stronger magnetic field than simply the ever-present Earth's, because most hifi equipment has at least one transformer lurking somewhere inside the case.

So, what we have is equipment which is in the presence of vibrational energy - whether airborne sound vibrations, or structure-borne vibrations from the room surfaces (most often the floor) - being excited by the acoustic energy pouring out of the loudspeakers. That equipment contains a fair amount of electrical conductors and, usually, a considerable source of magnetic field. It's hardly surprising, then, if that equipment generates some stray electrical current or other. It's quite likely, too, that the windings in the transformer itself could be a principal source of stray vibrations, and hence electrical 'noise', themselves.

Of course, these currents are likely to be fairly small, and many people argue that because of this, as a possible source of disruptive noise it is of no consequence. I disagree, because I've heard the benefits that can come from using carefully thought out support systems, designed to minimise the amount of stray acoustic and vibrational interference feeding back into equipment.

The thing that these sort of equipment supports have in common is that they increase the intelligibility of the music. Imagine if an operatic tenor came to sing in your bathroom: the sound might be very loud and very impressive, but discerning the words would be more difficult because of all the reflections and reverberations within the room. Put the tenor in your sitting room with its soft furnishings and carpets, and making out what he was actually singing would be much easier. This effect is sometimes referred to as 'time smear' – the music reaches your ear from several routes: the singer himself, and the reflections from the walls and other hard surfaces in the room. Because the distances to these reflections varies, they all arrive at your ear at slightly different times, and the music becomes subtly blurred and harder to make out.

Electrically, something similar seems to happen when microphony affects a hifi system. A musical signal (think perhaps of a loud bass note) excites the equipment, which vibrates and generates a minute electrical signal, which 'feeds back' into the amplifiers and thence out again to your loudspeakers. This spurious signal is related to the musical signal, but delayed in time and much reduced in volume. The loudspeakers merely report what they receive, which is a musical signal which is smeared in time. When this happens in the bass, it often results in a boomy, tuneless or indistinct sound which can dominate the speakers' output.

People sometimes think this is a characteristic of the room itself, describing it as a 'room mode' and something you can only control acoustically. They may sometimes be right, and certainly this problem may be exacerbated by particular resonant frequencies of the room itself, but if it is possible to 'tame' the spurious vibrations getting back to the system, then the problem of the system 'self-exciting' in this way can be made much more manageable. It has been my experience that using decent equipment supports often reduces acoustic problems with room modes to the point where they are no longer a problem.

At higher frequencies, this acoustic 'feedback' effect can result in vagueness about when notes start and stop, lack of clarity in vocals, or 'splashy' cymbals, or sibilance, or any number of ailments we describe in our systems. One thing which great musicians all have is a superb sense of timing. If your system obscures that timing, you can't expect to appreciate just how great the musicians are.

So well-designed system supports can help in two ways. First, they can allow vibrations to pass out of the system before they can cause harm; secondly they reduce the amount of structure-borne vibrations which propagate back into the equipment in the first place. Some do this by damping the routes for external vibration to get back to the equipment, some do it by providing a way for vibration to 'drain away' harmlessly – a bit like letting stray electrical signals pass to earth. What matters is how effective the designer's chosen implementation actually is in reducing this susceptibility to stray vibrational energy.

Some stands resonate, intentionally or otherwise: glass shelves or metal structures will often 'ring' with a definite note when struck. In my experience, unless such ringing is very carefully managed, it rarely leads to a musically satisfying system, because it is likely to mean that the vibrations

at certain frequencies will be emphasised in the support stand - it resonates and the vibrational energy is amplified. If you have followed me so far, you'll realise that that is Probably Not Going To Be A Good Thing.

The benefits of a well-chosen support stand will most often be noticed in terms of clarity and intelligibility. If the moment that a note is struck is clearly and cleanly defined, it is much easier for your mind to recreate the illusion of a real musical event. So try not to think of an equipment stand as merely something to keep all your hifi in one place and stop the cat sleeping on it, think of it as an essential component in the chain. So if you've just changed your mains, interconnect or loudspeaker cables, and there is something not right about the result, don't automatically blame the cables. Try experimenting with some well-chosen system support. The results may surprise you.