Harmonic Resolution Systems RXR/R-Shelf Equipment-Support System - The Audio Beat - www.TheAudioBeat.com

ometimes the first challenge of reviewing audio equipment lies in understanding the problem the component is designed to address *before* assessing how well it succeeds. Generally speaking, we tend to assume that the role of the product is both understood and well defined. Beyond describing how it approaches that task, the task itself is clearly understood, be it the role of a CD player, amplifier or speaker. But there are also situations in which the function of the product is so widely misunderstood and wildly misrepresented that it's actually necessary to examine or define that task itself. The subject of this review is a case in point. In order to appreciate just how different, clever and effective the Harmonic Resolution Systems (HRS) products really are, you first have to understand that the task of simply supporting an audio system is both a lot more complex and a lot more critical than popular wisdom assumes.

Prices: RXR, $
depending on c
double-wide R
of a single-wid
$495; Vortex, $
$1235 per set o
$36.50 to $130
height; Dampi
$320 each, dep
thickness.

Warranty: Five
labor.

Harmonic Reso
2495 Main Stre
Buffalo, New Y
(716) 873-1437
www.avisolatio

I can almost hear the mutterings of dissent tinged with disbelief: "What? It's just a rack. How difficult can its job be?" Well, the answer is, "A lot more difficult than most of us suppose -- starting with the assumption that the term 'support' equates to 'rack.'"

The very nomenclature applied to equipment racks and support components is itself misleading. Most manufacturers, dealers and consumers think in terms of (and use the terminology of) isolation. That's certainly an important part of the story, but it's far from the whole story. In isolating a component -- an amplifier or CD player for example -- most racks and platforms are seeking to protect it from structure-borne vibration, mechanical energy that can cause microphonic distortion and degrade sonic and musical performance. It's a premise that, once examined, is all too clearly flawed. In accepting that spurious mechanical energy can degrade the audio signal, it also ignores two important facts: first, that not all energy is structure borne, with considerable airborne energy also hitting the chassis of any component (at least any component in the same room as your loudspeakers) as well as energy transmitted via the AC supply, and second, that the signal itself is carried by circuits inside the chassis, built from components -- such as disc transports, power-supply caps and transformers -- that themselves generate significant amounts of mechanical energy, energy that may be lower in magnitude than structural or airborne sources, but is co-located with the signal itself.

Herein lies the heart of the conceptual disconnect, the gap in our received wisdom. It's not the equipment we need to isolate but the signal. Once you grasp that fact, suddenly many things start to make sense: why locating equipment in a different room to the loudspeakers makes such a difference -- as anybody who has tried it can attest. It also explains why so many critical listening facilities keep everything except the speakers outside the room, thus minimizing the impact of airborne energy and eliminating it as a variable. Of course, if it's electronics that you are listening to and the chassis design is part of the assessment, then that might not be such a good

thing.

There is also the effectiveness of mechanical grounds that bypass the soft feet so often fitted to equipment. In recent years we have experienced products like the Stillpoints, Nordost's Sort Kones and more recently the Neodio Origine B1 that can transform the performance of audio systems, simply by implementing effective mechanical grounding of the equipment chassis. Yet these are, in turn, simply more efficient versions of much earlier products like the original Mod Squad Tiptoes and Symposium Rollerblocks. Taking the approach to its logical extreme has highlighted its value, but still we tend to ignore how it fits into the wider scheme of things.

Finally, there are the benefits of supporting and mechanically grounding AC-supply components. If you think using grounding elements under equipment produces impressive results, wait until you try them under AC-distribution blocks and power supplies.

The fundamental musical benefit of each of these steps can be easily demonstrated -- yet at the same time results can be variable, their relative value unpredictable. Different equipment reacts differently to different support components, and once again received wisdom fails to explain why. Isolating the fragile audio signal is clearly important to optimizing system performance, but to do so effectively requires a systematic approach and a clearly defined strategy -- both things that depend on a clear understanding of the mechanisms at work and the way they affect both individual components and the system as a whole. In fact, in many ways our understanding of the problem has been upside down for many years and that in itself has prevented us fully comprehending its nature. But once you start to think in terms of energy paths within the system, the sources of spurious mechanical energy and thus how best to deal with it, the solution starts to become clear.

With four significant sources of energy to deal with (structure-borne, airborne, AC-generated and self-generated) any successful isolation strategy needs to be able to deal effectively with all of them. The problem is that not only do the problems themselves vary in relative importance

depending on the situation -- for instance, whether the system is standing on a suspended or solid floor -- different equipment is more or less able to deal with them too. Typically, a lightweight, folded-steel chassis will behave very differently under assault from airborne and internally generated energy than a monolithic or slab construction, especially one involving internal damping. Likewise, the different elements in different product types -- motors and mechanical bearings in turntables or tape decks, the transports in CD players, the different sizes and types of power supplies in different products -- cause different problems and react differently.

The type, placement and effectiveness of grounding and/or damping components in this instance are going to vary enormously from one product to another -- and that's the key point. When it comes to equipment support and effective isolation of the audio signal, there is no one-size-fits-all solution. Instead, what's needed is a range of responses that can be configured according to budget and circumstance to deliver the best possible solution. Of course, if that's also a solution that can be upgraded or adapted in the future as funds allow or the system evolves, so much the better. This modular, adaptable model and approach is exactly what the HRS components strive to supply, an equipment-support toolkit, from which you can pull the pieces that your system's circumstances demand -- and your wallet allows.

"But it's just a rack. How complicated can that be?" Let's take what looks like the simplest single component in the HRS system and see. The Nimbus coupler looks just like one of those sorbothane equipment isolators that were popular ten or fifteen years ago -- except that just like everything else in high-end audio, it got bigger. In fact, just like the HRS racks (and pretty much everything else the company makes) there's a lot more here than meets the eye.

For starters, the Nimbus exists as a range of different assemblies, ranging from a single disc of a proprietary polymer compound, to pairs of those discs separated by aluminum pucks of varying thicknesses. At first glance it

might seem as simple as providing a range of heights to suit different situations and to bypass the different-height feet fitted to various equipment. But note that one effect of the different spacers is to maintain the diameter and thickness of the polymer discs. That's because the physical proportions of any polymer have a significant impact on its performance characteristics. The large load area and short stack height of the Nimbus polymer element combined with its very-high-bulk modulus make it very stiff in global compression and thus it adds stiffness to a standard sheet-metal chassis, while the large contact area behaves as a constrained-layer-chassis noise-reduction element. It probably goes without saying, but it is also mechanically stable and consistent in performance at temperatures up to 400 degrees Fahrenheit.

The polymer provides the crucial interface, and it's here that things start to get interesting. On the face of it, the "soft" interface provided by the polymer will be a barrier to energy collected by or trapped within the chassis -- just as using sorbothane isolators created a barrier to energy reaching equipment from the supporting surface. This goes against the notion of mechanically grounding the product being supported, providing an exit path for internal energy so that it can be passed to and dissipated within the supporting structure. Except that, depending on the physical proportions, the behavior of the polymer that is used in the Nimbus is frequency-dependent, "soft" at low and mid frequencies, for effective constrained-layer damping of chassis resonance, stiff at high frequencies to dissipate energy as heat. It's a carefully considered solution to the problems presented by a classic bent-metal chassis, where the Nimbus acts to damp low-frequency chassis modes while also providing an exit path for the higher frequencies generated by components passing signals and airborne energy. The large diameter makes for a large contact patch that delivers both more-effective damping and more-efficient energy capture.

Sounds too good to be true, right? Well as Mike Latvis of HRS points out, water feels pretty soft when you wade through it; try hitting it at 300mph! It's typical Latvis: clear, straightforward and obvious once you think about it. But then you'd expect nothing less from a man whose CV includes stints

as a QA engineer for the nuclear industry and specialist in the vibration analysis of mission-critical aerospace components. Take the rotor head of the Black Hawk helicopter. That's one piece of advanced-composite technology that could quite literally be shaken apart, unless it accommodates motions just where it needs to and is damped just so. Analyzing that sort of problem and developing the polymer damping compounds and composite structures to deal with it are what Latvis does. He's an engineer's engineer in an audio world where evidence-based explanations of performance benefits tend to be long on faith and short on science. But long before he got to play with such man-sized toys and their equally man-sized problems, he played with trumpets and with audio systems, the root of an enduring fascination with music and its reproduction.

But to fully understand just how deeply that fascination lies, it's necessary to look at the Vortex, the other HRS equipment foot. Just the fact that it exists, a different answer to a different problem, is telling in itself. Outwardly similar to the Nimbus, apart from the cone on the bottom, it's actually a totally different beast, built from different materials to do a different job. Just pick one up and you'll get the picture: Vortex weighs a lot more than Nimbus. The "puck" is a two-piece non-magnetic stainless-steel assembly that houses a patent-pending labyrinth designed to help dissipate high-frequency energy as heat. The polymer disc on top, a material specific to the Vortex, is also noticeably harder. That's because the Vortex is designed to work with stiffer, plate-to-plate or monolithic-type chassis construction, structures that typically exhibit far higher resonance modes and which drain energy more efficiently. The stiffer polymer interface and heavier, dispersive structure make it more effective in this scenario, a situation in which the Nimbus struggles to match the performance of something like the Nordost TC Sort Kones. Flip a set of four Vortex polymer side down and you'll discover that one is equipped with a threaded dome rather than the cone on the others. Adjustable in situ using the supplied and very long prybar, this odd Vortex out allows you to retain the grounding benefits of four-point contact (or more if necessary) while maintaining absolute stability of the supported chassis -- no wobbles

and no rattles. Of course, you could just use three standard Vortex, but add the fourth and you'll quickly establish that three simply don't sound as good. This is exactly the sort of configurable, adaptable set of "tools" that I outlined above.

Getting started with HRS might not cost as much as you think

One glance at the prices at the top of this review will tell you that even if the RXR/R-Shelf combination delivers the least costly HRS rack, that doesn't make it no-brainer affordable -- at least in monetary terms. Tot it up and a four-shelf support works out at $6775, the kind of coin that would have most audiophiles thinking in terms of a nice, sexy box of electronics.

But that attitude is mistaken on two counts. First, if you've already spent around $15,000 on the electronics and speakers in your system, then unless you've already paid attention to it, the system's infrastructure (cables and supports) is going to be the next most musically effective area of expenditure. Put bluntly, unless you have a truly monumental mismatch in your system, it's almost certain that spending that money on the RXR/R-Shelf rack will make a bigger and more important musical difference than a shiny new pre-amp -- or any of the other electronic boxes for that matter. The reason is simple: proper support is essential to actually extracting the full performance from the equipment you've already bought.

Second, you don't need a complete rack to start enjoying the benefits of HRS's expertise. As it explains in the main body of the review, there's a strong argument to suggest that the Nimbus and Damping Plates aren't just the easiest place to start, they also deliver the biggest bang for your bucks -- not because they are the most effective part of the complete system, but because they are so effective given their price and can be added to almost any existing rack to lift its performance. Add in the fact that they carry over to any subsequent, full HRS rig and the opportunity to dip your toes in the HRS water, a little at a time while you investigate the brave new world of proper equipment support and develop an overall strategy becomes irresistible -- especially once you hear the initial results. The R-Shelf is becoming an increasingly common practical and performance upgrade for the skeletal Stillpoints ESS rack, either with the existing Stillpoints or Nimbus/Vortex couplers (something Dennis Davis will write about separately). It's a perfect example of just how effectively the HRS interface

elements can be incorporated into existing systems.

Once again, our natural inclinations (and assumptions) seem to have got the problem upside down. It really underlines and reinforces the fact that it is actually the signal that we are trying to isolate, rather than the boxes that contain it, a factor that you need to consider whenever you address the issue of equipment support, whether with HRS pieces or an alternative. As soon as you start to think in this way, the solutions you adopt become significantly more effective -- while the financial steps to achieving an optimum arrangement become if not exactly bite-sized, then at least easier to swallow.

-Roy Gregory

You'll also have noticed the Damping Plates (DPs) that are designed to sit on top of components. Again, these are apparently simple in that they "damp" the chassis top plate, but it's worth looking at how they do it and the additional benefits they bring. Essentially a slab of aluminum with the softer polymer used in the Nimbus applied to one side, placing them polymer pad down across a chassis effectively both stiffens and converts that panel into a constrained layer, helping to absorb and dissipate vibrational energy. The damping plates are available in three different sizes and two different thicknesses, to suit different chassis dimensions and structures. The slimmer DP II is intended for thin sheet-metal chassis and where vertical space or budget is restricted. The heavy-duty DP X is aimed at thick sheet-metal or billet chassis, or where vertical space and budget are less restricted. That's because the stiffer the chassis/damping-plate pairing becomes, the more effective the constrained-layer damping is; but the stiffer the chassis is the stiffer the damping plate needs to be in order to have same relative impact on the control and elimination of chassis noise.

But there's a second benefit that goes with adding damping plates to equipment -- and that's the resulting increase in mass. Increasing the unit's mass makes it more resistant to airborne energy. But, any support system constitutes a series of mechanical filters -- some much more

effective than others. The damping plates act both to increase the suspended weight of the component and its supporting surface together, and decrease the proportion of that mass that represents the component itself. The result is a more effective filter with a lower cutoff frequency at the bottom end. So the damping plates don't just act to improve chassis performance; they also improve the effectiveness of the isolation from structure-borne energy.

All that and we haven't even gotten to the rack itself. Perhaps not surprisingly, there is no single HRS rack. Instead there are no fewer than five different frames and four different shelves, or support platforms -- and that's before you consider the fact that three of those platforms come in a range of different load ratings depending on the mass of the component (and other HRS pieces) to be supported. If you were in any doubt about the seriousness with which Mike Latvis treats the problem of supporting his (and your) audio system, it should have totally evaporated by now.

Faced with such a plethora of options there really is only one place to start -- and that's at the beginning. The RXR rack that forms the basis of this review is the most affordable option in the HRS stable. It is also the only one based on a solid maple frame -- at least that's the way it looks. The other racks employ billet-aluminum construction (although the MXR's massive uprights are based on a 3.5"-thick slab of 75-layer Baltic ply). There's no faulting the engineering aspect of the higher-end racks, but there's also no getting away from the hard technical aesthetic they embody. I suspect that for many potential customers, the RXR will be easier on the eye as well as the wallet, with blond and black options available.

Like the rest of the HRS frames, the RXR is itself modular, with the height and number of the uprights (33", 43" or 54", they come in single- and double-sided varieties so that you can daisy chain multiple bays together) as well as the number and spacing of the shelves, all user-selectable and adjustable. Each level bolts into an aluminum plate bonded to the inside (or both sides) of the upright, the maple sleeve damping the aluminum without impeding its energy transfer. There's also a choice of two

footprints, 25" x 19" or 23" x 17" (simply take 4" off the width for the actual real-estate available to support equipment).

That modularity as well as the mixed-material nature of the structure and the close-grained hardwood employed makes for an inherently dispersive construction, but if you suspected that HRS would be looking for more of a performance benefit than that, then you'd be right. The levels in this instance are actually supporting "picture frames" into which you fit the actual platforms. The inside front and back of each frame takes the form of a narrow beam that stiffens the frame and on which the platform rests. Those beams are constructed from a multi-layer composite that constitutes the first stage in a broadband isolation filter, a construct that is completed by the feet used on the platforms themselves. Work your way up the range and the number of layers and the resulting effectiveness of the filters increases as you go, but even the RXR has a remarkably sophisticated composite structure, consisting of a thick aluminum base, a specifically developed polymer layer, Baltic ply and then another aluminum skin with a top laminate of scuff-proof material.

Just pause for a second and consider this: the three-shelf double-wide RXR frame being reviewed contains 960 square inches of that polymer material, around a third of an inch thick. That's a lot of material, meaning that HRS had to develop a polymer that wasn't just effective, but cost effective too, if they were going to meet their goal of a more cost conscious support solution. Beneath the frame you'll find large, conical feet that allow you to level the rack. The uprights are also supported on cones, ensuring that you don't suffer sag if you daisy chain two or more bays together. Together those cones ensure both a direct mechanical ground path for the shelves and complete stability.

That in turn brings us to the choice of platforms. To start with -- and in keeping with the affordable nature of the RXR -- I'm going to confine myself to the "budget" R-Shelf (I'll be getting to the more sophisticated and expensive platforms later). Deceptively simple, HRS's entry-level support shelf consists of a sheet of black high-density composite (a resin/cloth

matrix that is subjected to enormous pressure as it sets) topped with that same scuff-resistant laminate, that sits flush with the top of the frame delivering a neat and space efficient solution. It is also available in both black and silver finishes. But flip the R-Shelf over and you'll be surprised by the underside. The 17.8mm-thick top plate is reinforced by a broad lateral brace of the same material, bonded securely in place, creating a 35.6mm-thick spine to significantly increase stiffness.

The whole is supported on three large, square pads of the same specially developed polymer used in the frame, two front and one back (or vice versa) that interface with the composite support beams and hold the shelf clear of the frame. More importantly, look at the cross-sectional diagram and you'll see how the support beam and shelf/pad interlock to create a single multi-layer solution where the two elements act in concert to create a single, integrated whole. Although it looks like a simple maple frame with a laminated MDF insert, it's actually anything but. Whether it is the choice of materials, the added rigidity of the brace or the cleverly engineered support solution (probably all of the above), the R-Shelf is both a remarkable and remarkably cost-effective performer. Certainly, using it in place of standard MDF or bamboo shelves brings a shocking improvement in performance, especially when used in conjunction with equipment couplers, regardless of type. In many ways it's the single most impressive element in this whole package and while it may have been a while coming, it was well worth the wait and if on the one hand it has helped achieve the goal of allowing HRS to offer a far more affordable solution, it has also ensured that their entry-level option still establishes a performance benchmark that most competitors will struggle to match.

So now that you've got your head around the different elements it's time to sum up and take stock. What you have here is a genuinely modular and configurable solution for system support. You can choose the format of the rack (height, width and number of shelves) as well as the equipment supports and interfaces. That means that you can prioritize and target expenditure on critical electronic components as well as having the ability to expand or upgrade the provision as time goes by (especially when you

factor in the higher performance platforms -- which we'll get to later), all with minimum redundancy of existing elements. So, it's smart, it's versatile and it ticks all of the boxes regarding equipment support and maximizing system performance, which finally means that we can get down to looking at how it works in practice and just how well it performs.

eviewing something like an amplifier is comparatively straightforward, at least as far as process goes: insert it into a system and ring the changes -- a few different preamps, several different speakers. In some ways, the approach to the HRS products isn't that different: you need to use them with a range of different equipment, embracing tubes and solid state, different chassis materials and constructions. But, assuming that we are interested in developing some sort of general understanding and support strategy beyond the specific performance of the RXR setup itself, you also need to use them in different physical situations: on different floors, solid and suspended, and in different spaces, large and small -- and that means in different rooms, adding a whole new round of listening to be done.

With that in mind I assembled a test rig consisting of the RXR stand with R-Shelves and a full complement of Nimbus, Vortex and Damping Plates, along with a Hutter rack in its upgraded form (with two sets of Track Audio feet in place of the standard spikes) as well as a collection of additional coupling devices from the likes of Neodio, finite-elemente and Nordost. To keep things manageable in terms of shifting equipment from one support structure to the other, I opted for simple integrated electronics, allowing me to establish a range of two-box systems. I used the following components:

- Arcam FMJ CDS27 CD/SACD player (classic bent-metal chassis)
- Gryphon Scorpio CD player (composite steel/aluminum bolted construction)
- Wadia S7i CD player (heavy plate-to-plate aluminum construction)
- Neodio Origine CD player (composite constrained-layer, energy-sink chassis)
- Gryphon Diablo 300 integrated amplifier (high-power solid-state

amplifier with internal DAC and composite steel/aluminum bolted construction)
- Icon Audio Stereo 60 integrated amplifier (tube integrated with classic bent-metal chassis)

These components were used for a series of direct comparisons in both of my two listening rooms, one large with a solid floor, the other of medium size (15' by 22') with a suspended floor. The only common chassis option missing was the milled-from-solid chassis as sported by the likes of the Jeff Rowland and Ayre electronics, although in the course of the review I've been able to experience a host of other equipment on the HRS supports, including such designs as well as turntables and phono stages, tube preamps and power amps, transports and DACs, all of which informed both the comparative listening and the conclusions. Likewise, a whole range of speakers has passed through the main listening room, although for the direct comparisons I employed the Wilson Alexx, while the Focal Sopra No.3 and Vienna Acoustics Liszt were employed in Room 2, ensuring plenty of low-frequency structural and airborne feedback to test the signal's isolation. The racks and cabling were arranged so that it was possible to hot swap the systems without disconnecting them.

Step one was a straight comparison between the two racks with the equipment on its own feet, in order to establish relative performance and also the level of performance that most listeners actually achieve. Starting on the solid floor, the HRS rack demonstrated a significant advantage over the otherwise impressive Hutter. Soundstaging, instrumental focus and dimensionality were all much more clearly defined, more coherent and more natural. Whereas the Hutter found instruments climbing with frequency and level, the RXR added considerable depth and a blacker background, and kept the orchestra on a single level, all indicative of a lower noise floor and more even energy dissipation. Timing, flow and phrasing were all more natural, fluid and unforced, with a broader and richer tonal palette.

These differences were consistent across different components and musical

genres, but perhaps one example served to demonstrate the benefits most clearly. In 1983 Deutsche Grammophon recorded an "all-Israeli" *Four Seasons* [Deutsche Grammophon Gesellschaft 419214]. Zubin Mehta conducted the Israel Philharmonic Orchestra, with Isaac Stern, Pinchas Zukerman, Shlomo Mintz and Itzhak Perlman taking a season each. There's little to recommend it as an overall reading. However, what it does offer is the chance to compare and contrast the playing and instruments of these four great violinists, from Stern's fluid lines and smooth poise to Zukerman's range and rich tonality, Mintz's vitality and attack to Perlman's presence, body and structure. Except that those differences only really emerge once the system is supported on the RXR rack. On the Hutter, the elasticity of phrasing, the tonal variance in the instruments and the playing, the sheer dynamism of Mintz against the effortless flow of Stern, these distinctions collapse, submerged in the heaviness of the full orchestral accompaniment. Without the sleeve notes you'd be hard-pressed to tell that this was four different players and four different instruments -- and that's a musically significant fact, irrespective of what or who you play, because along with that rhythmic and harmonic resolution, you lose expressive range too.

At this point, running the different components altered the sound of the setup, but did little to alter the relative performance of the system(s) on the two racks. Benefits varied across the different component types (amp or CD, solid state or tube) but not necessarily in the manner that you might predict. I'll come back to the specifics later, but in the meantime, what had a much greater impact was shifting both racks and system onto the suspended floor. Here, the performance differential widened dramatically, the Hutter becoming muddled and congested, with a flattened soundstage and considerably less transparency and focus when compared to the same system perched on the RXR. It's hard to avoid the conclusion that the HRS rack and shelves provided better isolation from structure-borne energy than the Hutter/Track combination, as witnessed by the rise in the noise floor of the system on the latter combination as soon as it was placed on the livelier and less-controlled suspended floor. Which brings us to the heart of the issue: the noise floor. The better you isolate the signal, the

lower the level of intrusive noise, whether that noise is low-level broadband or higher level, discrete frequency in nature. Both are destructive in different ways, and the RXR/R-Shelf system's superior ability to deal with spurious energy hitting the rack either through the floor or through the air is both clear to hear and sufficient to justify the difference in cost between these two racks.

. . . the differences I've described are absolutely fundamental to audio performance and musical enjoyment. Neglect them and you undermine the performance of the system as a whole, often in an insidious and unsuspected manner.

Make no mistake -- the differences I've described are absolutely fundamental to audio performance and musical enjoyment. Neglect them and you undermine the performance of the system as a whole, often in an insidious and unsuspected manner. As impressive as the improvement wrought by the HRS rack is, it also risks leading us into a false sense of security. After all, the rack only deals with external sources of energy -- and that's only half of the problem. The next step in the process was to insert the various couplers and damping plates -- which is where things got really interesting.

It's no surprise that adding the Nimbus or Vortex couplers and Damping Plates to the RXR rack lifted performance substantially. Anybody who has played with Stillpoints, Sort Kones or even simple maple blocks to bypass the feet on their equipment will already know just how effective these grounding devices can be. But like most things HRS, their solution goes further and is more configurable, tailoring the response more precisely to each specific piece of equipment. What's more, by damping the chassis itself, the HRS components attack the problem at source as well as providing an exit path. Placing Nimbus couplers under either the Arcam or Gryphon CD players and a Damping Plate across the top plate, along with Nimbus couplers and a Damping Plate on the Diablo integrated produced more space and separation, a soundstage that stepped away from the speakers, greater dynamic range and control and a broader tonal palette.

But where they really scored was in terms of musical flow and expression. With Anne-Sophie Mutter playing the *Carmen Fantasie* (Levine, VPO [Deutsche Grammophon Gesellschaft/UHQCD 482 436-2]), the sound gained body and sweetness with a greater sense of phrasing, a more vivid impression of Mutter working her bow. The accompaniment became defter with far more precise dynamic graduation. In fact, precision is really what underpins the performance, but not at the expense of a mechanical or clinical quality -- quite the opposite. It's just easier to hear what is being played, what notes are, where they start and where they stop. The old adage about "hearing the gaps between the notes" applies with a vengeance, those pauses and hesitations bringing purpose, attack and a sense of intent to the playing.

But there is a caveat to all this: simply place four Nimbus beneath a component in a regular rectangle and a DP across the central, long axis of the top plate and you'll hear the benefits. Now start playing with the positioning of the Nimbus and DPs and you'll hear further improvements. Just like other couplers, precise placement of the Nimbus assemblies at sources of mechanical energy or chassis nodes reaps a sonic dividend. Likewise, the nature, fixings and vibrational signature of the chassis means that moving the DPs (yes, you can use more than one) can also improve performance still further. However, the large interface area of the HRS devices can also be a limitation: you need to ensure that they don't hit bolt heads or other irregularities in the chassis underside, disturbing both level and consistency of contact, or block venting, a particular issue with closed-chassis tube designs or hot-running amps.

That in turn brings us back to the question of efficacy and technology subtypes. The general assumption seems to be that tube electronics are the most susceptible to microphonic influence, but both long-term listening and these direct comparisons suggest otherwise. While shifting the Icon Audio integrated amp from rack to rack and hoisting it on Nimbus couplers certainly added to its sense of focus and resolution, these were largely cosmetic improvements. Instead it was the solid-state electronics that gained most in musical terms, especially the digital devices. The

changes might have been less obvious but the damage being done was far more insidious, impacting not just the noise floor and degree of detail, but the tonal and temporal realms too. Where the tube amp was adding harmonics to the picture in the basic support scenario, the solid-state electronics were stripping them; where the tube amp managed to maintain its sense of musical shape and flow, the solid-state amp and particularly the CD players all sounded more mechanical, awkward, clumsy and far less fluid, the very qualities that were progressively restored as soon as I started to improve the rack and support components.

While many might find this surprising, it was also utterly consistent, extending beyond the direct comparisons into longer-term experience with a wide range of Audio Research and VTL equipment as well as solid-state designs from Gryphon, Tom Evans Audio Design, Lyra Connoisseur and Naim (where the Nimbus and especially the DPs were extraordinarily effective). There are many possible reasons for this counterintuitive result, not least the different materials and sheer number of components and subassemblies involved in solid-state designs as opposed to tube circuits, resulting in a completely different vibrational character and vulnerability. Past experience with digital circuits also suggests that they are particularly prone to both internal and external mechanical interference, with players, DACs and transports all readily responsive to improved mechanical grounding and system isolation. This helps explain why top-loading and energy-sink transport designs have always been notably successful -- and why products such as the dCS multi-box systems (most recently the Vivaldi and Paganini) respond so dramatically to changes in siting and support.

With all that in mind, let's look more specifically at the results involving the Wadia and Neodio digital electronics. The Nimbus certainly worked with these players, but the difference was not as substantial as I'd have expected and in the case of the Neodio what I gained on the tonal and spatial swings was lost on the dynamics and rhythmic roundabouts. The damping of the Wadia's flat plates was clearly effective, but the Origine's more sophisticated casework apparently didn't need that help -- or at least not nearly as much of it. It was these anomalous results that caused some

considerable confusion early in my listening with the HRS products -- and mandated a flying visit from Mike Latvis to first hear what I was describing and to then produce, not unlike a magician pulling a rabbit from his hat, prototypes of what were shortly to become the Vortex couplers. Slipping them under the Neodio CD player was a complete game-changer, increasing harmonic and detail resolution, separation, dynamics and presence, all while restoring that crucial sense of human agency and intent. Equally effective beneath the Wadia, the Vortex (along with the R-Shelf) really was the missing link in the HRS system, affording as it did that specific response to the super-rigid or energy-sink chassis designs that are so prevalent in high-end audio.

Taking things a step further, I added the CEC TL-3N transport to the equation, using the Wadia S7i as a dedicated DAC, thus eliminating or separating the transport as a source of mechanical vibration. This did two things: demonstrate just how effective the Vortex were in the case of the CEC, but also reinforce the fact that the Wadia's DAC still remained super sensitive to support, with or without its transport in operation. As impressive as the CEC is as a stock transport, the addition of Vortex and DPs brought not only a significant increase in dynamic range, body and presence, it added significantly to the sense of musical contrast and drama. On the Kleiber/Bayerisches Staatsorchester recording of *Die Fledermaus* [Deutsche Grammophon Gesellschaft 457 765-2], the improvement in the sense of location and staging was obvious, but it was the added nuance and natural vocal articulation, as well as the range and subtlety of the orchestral shadings, that really brought the performance and particularly the humor to life. When it comes to digital electronics, don't assume that just because you only use a DAC, you don't need to worry. Those large-scale integrated circuits seem especially, almost peculiarly, vulnerable to mechanical interference.

All of which of course raises the question, What happens if you shift the whole system, complete with Nimbus or Vortex and DPs onto the Hutter rack? The answer is, you get a similar, substantial improvement, the performance benefit in either case being greater than the already

impressive difference between the two racks -- at least when compared on the solid floor. It's a result that put the overall strategy under a stark spotlight. But before we go there, let's repeat the exercise, but this time on the suspended floor.

Using the RXR rack, I achieved a similar result, although the improvement was not quite as great as on the solid floor. But shifting the coupler/DP rig onto the Hutter, although the improvement was there and still definitely worthwhile, it was nowhere near as great as with the HRS rack in this context. On the all-HRS setup, Mutter's bowing was by turns graceful and incisive, the big orchestral tuttis that open and punctuate the piece both big and complex, constructed from different instruments playing in concert. Shifting to the Hutter while still using the HRS couplers and DPs caused the sound to collapse in on itself. Those big orchestral interventions were diminished, sounding thickened and slab-like, less explosive. Mutter's bowing became less fluid and clumsier and it lost its brilliance, both in terms of tonality and technique.

These were not small differences, turning a captivating and involving performance into just a recording. Just as importantly, they were not differences that could be overcome by throwing money at the boxes in the system. The mechanical support and termination of electronic components was clearly critical to their performance. Fail to deal with the problem and it will undermine everything else that you do. But how exactly do you deal with it? This brings us right back to the whole question of developing a support strategy and understanding the problem.

One of the key conclusions that we can draw from both the long-term listening and the side-by-side comparisons described here is that whilst there are two distinct sides to this problem (the isolation of the signal from external energy sources and its isolation from energy generated within the equipment that transfers or transforms it) the relative importance of those factors varies according to the situation. The corollary to that is, of course, that any solution that fails to deal with both problems is self-limiting at best, self-defeating at worst -- exactly the flaw in most of the thinking

applied to this problem and the products it generates.

Looking at the two examples I've cited, the large space with the (very) solid floor and acoustically sympathetic dimensions minimized the impact of both structure-borne and airborne energy. In this instance, the benefits of the couplers and DPs actually outweighed the impact of the RXR rack and R-Shelves -- even though the HRS rack still outperformed the Hutter setup, itself something of a benchmark amongst more conventional (and affordable) options. If you want me to put a figure on the proportional impact, I'd put it at 60/40 in favor of the couplers and DPs. But (and it's a very big *but*) shift the test rig onto the suspended floor and not only did the RXR pull away from the Hutter in performance terms, it also narrowed the gap on the couplers and DPs, switching the equation 55/45 in favor of the rack. Now factor cost into the overall calculation and a generalized approach finally starts to suggest itself.

Given the critical musical importance of equipment support, it's tempting to simply say, "Deal with it" and leave the recommendation at that. But the problem is that most of us already own a rack of some sort and simply migrating to a more sophisticated solution such as the HRS RXR is costly and inconvenient. Tot up a full suite of rack, shelves, couplers and DPs and the total is pretty frightening. However, as I've already pointed out, the HRS approach is both configurable and modular, allowing you to get there in bite-sized chunks. The question then becomes, Where do you start? Let's assume that you have your equipment on a half-decent rack of some sort -- which means no welded steel, no glass (laminated or otherwise) and hopefully no MDF -- then rather than replacing that rack lock, stock and barrel, I'd flip the response upside down. Rather than jumping straight into a rack and then adding accessories later, I'd start at the equipment interface itself. The most cost-effective approach is to apply HRS couplers and DPs, targeted on the key components in the system. Not only are they effective in all situations (albeit more so in some), the optimum solution for each component is both predictable and consistent while they also deliver the biggest initial bang for your buck. Once you have your components individually supported, you can look at shelves to replace

existing ones (if the R-Shelves will fit) or shelves and a rack if necessary.

Of course, your existing investment in direct supports and DPs carries straight over to and magnifies the benefits of the shelves/rack once you reach that point. You can literally transfer your system to a superior supporting strategy one step at a time. For example, most of us have a system that overflows one single rack, so upgrade by stages. Start with a single-width RXR to support the key signal chain and then add the frames and upright to make it doublewide at a later date. That way, the expenditure comes stage by stage, you can target each slice of the budget for maximum effect and you get maximum musical benefit at each step of the way. Where things get trickier is deciding how soon you need the rack and how much rack you need -- and a lot of that is down to your room and its floor. The better behaved your listening space is -- acoustically and mechanically -- the less impact even the most effective rack will have. Sadly, in the vast majority of cases, our acoustical concerns run a very poor second to practicality and constructional norms, which is exactly why a rack like the RXR can have such a profound effect on system performance.

hroughout this piece, terms like *affordable* and *cost-effective* have kept bubbling up. Take a glance at the full HRS range and it's pretty obvious why that is. The RXR/R-Shelf combination pretty much halves the price of HRS ownership -- at least compared to the next model up, an SXR frame equipped with R3X platforms, while the MXR, flagship VXR and the M3X platforms simply ramp the price level way, way out of sight, at least for most of us. That's a pretty big barrier to entry, but it's also a barrier to better system performance. In creating the RXR frame and R-Shelf, Mike Latvis has succeeded in offering a genuine, fully formed, fully engineered HRS solution at a much more approachable price. In doing so he has created a product that gives little away in performance terms or versatility when compared to its more expensive brethren, not least because it is

In creating the RXR frame and R-Shelf, Mike Latvis has succeeded in offering a genuine, fully formed, fully engineered HRS solution at a much more approachable price.

compatible with the same equipment couplers and isolation platforms that grace the flagship solutions. The RXR frame is a brilliant performer, made all the more impressive and relevant by the creation of the R-Shelf to go with it. But it also offers the option to incorporate the more sophisticated isolation options from further up the range, in a targeted or even in a general way -- and that's exactly where we're going next.

Meanwhile, it is tempting to look at (and possibly dismiss) the combination of RXR and R-Shelf as HRS on the cheap -- and in at least one sense you'd be right. But, while it is remarkably affordable for the performance delivered and the fundamental musical foundation it provides for your system, there's nothing second-best about using the RXR and R-Shelf. Its performance stands head and shoulders above more affordable (and quite a few, far more expensive) options. Look at the engineering, the complexity, quality and sophistication of the design and materials involved, but above all the completeness of the thinking and solution on offer and the conclusion becomes self-evident: yes, it really *is* real HRS, and in real terms, in musical terms, it *is* inexpensive.

Associated Equipment
Analog: VPI Classic 4 with SDS and VPI JMW 12.7 and Tri-Planar Mk VII tonear turntable with 4Point 14 tonearm; AMG Giro with AMG 9W2 tonearm; Acoustic Allnic Puritas and Puritas Mono, Clearaudio Goldfinger Statement, Fuuga, Kuzm Etna, Dorian, and Dorian Mono cartridges; DS Audio DS-W1 cartridge with mat Stillpoints Ultra LP Isolator record weight; Connoisseur 4.2 PLE; Audio Researc Tom Evans Audio Designs Master Groove phono stages. Digital: Arcam FMJ CDS27 CD/SACD player, Audio Research Reference CD9 CI Scorpio CD player, Wadia S7i and 861 GNSC CD players, CEC TL-3N CD transpo CD player, Naim UnitiServe music server. Preamps: Audio Research Reference 5 SE and Reference 10, Connoisseur 4.2 LE Designs The Vibe, VTL TL7.5 Series III Reference. Power amps: Berning Quadrature Z monoblocks, Audio Research Reference 150 Series II Reference stereo amplifiers. Integrated amps: Gryphon Diablo 300, Icon Audio Stereo 60. Speakers: Wilson Audio Sasha W/P Series 2/WATCH Dog system, Coincident Sp Pure Reference Extreme, Vienna Acoustics Liszt, Ubiq Audio Model One, Focal S

Cables: Complete looms of Nordost Odin or Valhalla 2, Crystal Cable Dreamline Acustica Virtuoso from AC socket to speaker terminals. Power distribution was v or Crystal Cable Power Strip Diamonds, with a mix of Quantum Qx2 and Qx4 po Qv2 AC harmonizers.

Supports: Hutter Racktime or Quadraspire SVT Bamboo racks. These are used w Kone equipment couplers throughout. Cables are elevated on HECC Panda Feet.

Acoustic treatment: As well as the broadband absorption placed behind the liste combination of RPG Skyline and Flat Panel microperforated acoustic devices.

Accessories: Essential accessories include the SmarTractor protractor, a USB mi can see what I'm doing, *not* for attempting to measure stylus rake angle) and Aes demagnetizer, a precision spirit level and laser, a really long tape measure and p masking tape. I also make extensive use of the Furutech anti-static and demagne the VPI Typhoon record-cleaning machine. The Dr. Feikert PlatterSpeed app has case of digital aiding analog.