



Minus K 25BM-8

Reviewer: John Potis

Analog Source: Rega P9 turntable, RB1000 & Hadcock GH Export arms, Benz Micro MC Silver, Rega Super Elys & Garrott Bros Optim FGS Cartridge

Digital Source: Accustic Arts Drive 1/ Audio Aero Prima SE DAC

Preamp: Bel Canto Pre2P

Power Amp: Art Audio Carissa, Bel Canto e.One REF1000 and Canary CA 160s, Musical Fidelity A5 Integrated

Speakers: Hørning Perikles, Anthony Gallo Acoustics Reference 3.1, Ohm Acoustics Walsh 4 with 4.5 mk.2 upgrade, Tidal Audio Piano

Cables: JPS Labs Superconductor and Superconductor FX interconnects and speaker wire, Furutech Digi Reference digital

Power Cords: ZCable Heavys, Red & Black Lightnings, JPS Power AC, Analog AC, Digital AC and Kaptovator power cords

Powerline conditioning: Balanced Power Technology 3.5 Signature Plus with ZCable Cyclone Power Cord

Sundry accessories: Sound Mechanics Performance Platform, 2-inch Butcher Block platforms with Quest for Sound Isol-pads, Vibrapod Isolators and Cones, Ultra & Heavy Zsleeves, Viablue QTC spikes under speakers, Auric Illuminator

Room size: 12' by 16' with 9' ceiling

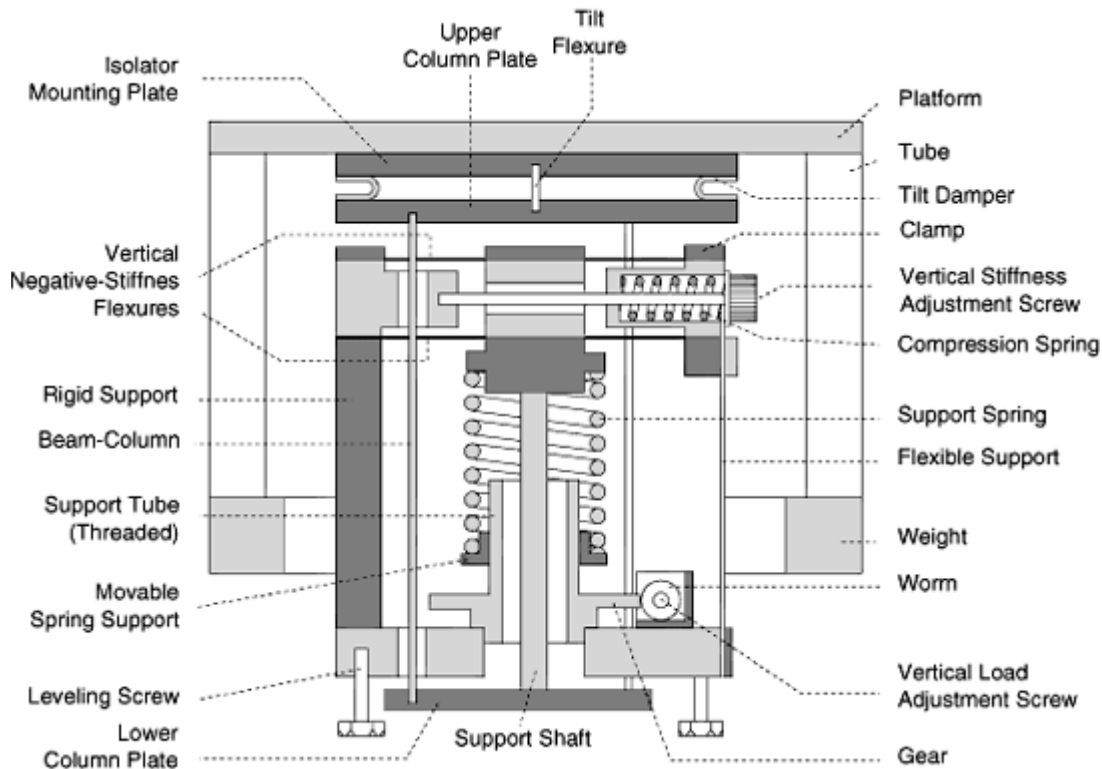
Review component retail: \$2,400 to \$2500 depending upon weight capacity



In all likelihood, you've not heard of Los Angeles-based Minus K Technology. While they're fairly new to audiophile circles, they are not a new company but have been pioneering spring-loaded isolation devices since 1993. Minus K was founded by Dr. David L. Platus who today serves as the company's president and principal inventor. Minus K was founded to develop, manufacture and market products based on patented negative-stiffness mechanism technology.

Platus himself holds B.S. and Ph.D. degrees in Engineering from UCLA and a diploma from the Oak Ridge School of (Nuclear) Reactor Technology. His credentials include a career in the nuclear, aerospace and defense industries conducting and directing analysis and design projects in structural mechanical systems and then becoming an independent consultant in 1988. Today Dr. Platus holds over 20 patents related to shock and vibration isolation.

Currently sold under the trade name Nano-K®, Minus K Technology's products represent an important enabling technology by optimizing the operation of vibration- sensitive instruments and equipment to unprecedented levels, reducing building and floor vibrations. Minus K customers include private companies and more than 150 leading universities and government laboratories in 25 countries. For the extensive list of Minus K customers, click [here](#).



I asked Dr. Platus to comment on a few of his more interesting customers and outré applications: "Our main customers are users of instruments and equipment that is very sensitive to vibrations. One class of such instruments are scanning probe microscopes (SPMs) that are used in nanotechnology and can resolve features as small as atoms and molecules, and can also move the atoms and molecules around to create "nano structures" that have unusual properties. Researchers use SPMs in many fields from biology to semiconductors to materials research.

"Another class of vibration sensitive instruments are micro-hardness testers that are used to determine mechanical properties of materials used in a variety of fields. They measure force-deflection curves and the deflections could be only a few nanometers. A nanometer is one billionth of a meter. There are about 50,000 to 100,000 nanometers in the thickness of a human hair.

"A number of "cool" applications come to mind. One application is that of a researcher who used our isolation system in the study of the effects of vibrations on fish. External vibrations in the lab were interfering with the research. Another application of our isolators is with fluorescent dye imaging equipment for studying neural activity of the brain. Fluorescent dyes are injected into the brain and weak optical signals indicate which part of the brain is active for various stimulations. The optical signals are very sensitive to vibrations.

"A third application is the use of our isolators to simulate "zero gravity" and to attenuate building and floor vibrations in the study of spacecraft structures. We isolated a 4,300 lb simulated spacecraft structure at the NASA Jet Propulsion Lab as part of the SIM Program whose goal is to measure distances between stars and planets to unprecedented accuracy using laser interferometry."

For a detailed discussion on just how the isolation platforms work, click [here](#).



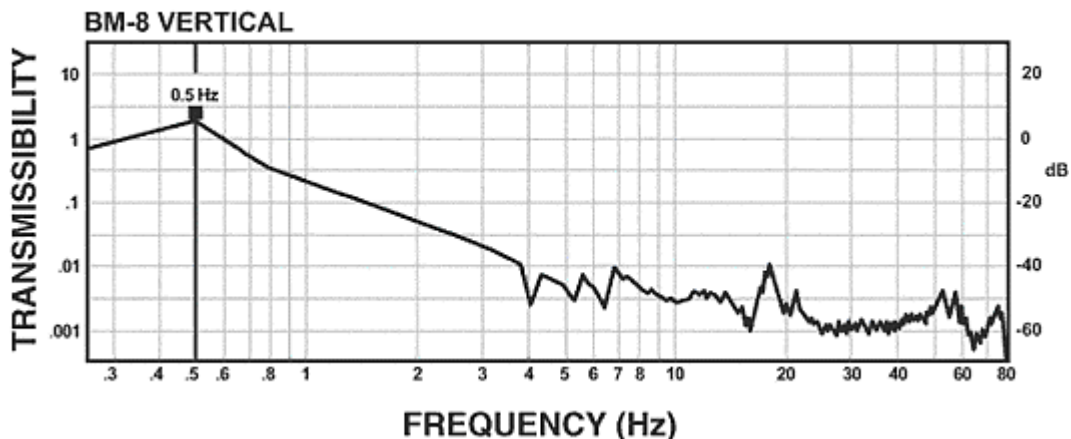
Scanning electron microscope on one of Nano-K's floor platforms

Minus K Technology routinely manufactures a line of products ranging from table-top models such as the 25BM-8 reviewed here to large isolation benches and platforms. The products differ in terms of the size as well as maximum allowable loads. It's important that the product be matched to the weight of the component isolated. Much like the shock absorber on your car, the springs must be under tension to optimally support and isolate the weight of the component.

The component under review is from the BM-8 Series. The 25 in its nomenclature denotes the nominal weight capacity though it works well with products up to 30 pounds. Also available in the series is the 50BM-8 and the 100BM-8, designed to support components up to 55 and 105 pounds respectively.

Minus K isolation products are said to employ a revolutionary concept of low-frequency vibration isolation. How low a frequency? Try half a Hertz. If you have a hard time relating, imagine depressing a spring-suspended platform and then releasing it. Its spring loading causes the platform to rise until it surpasses the platform's resting level before starting its descent again. Up and down like any spring-loaded device until it comes to rest half-way between its highest and lowest points of travel.

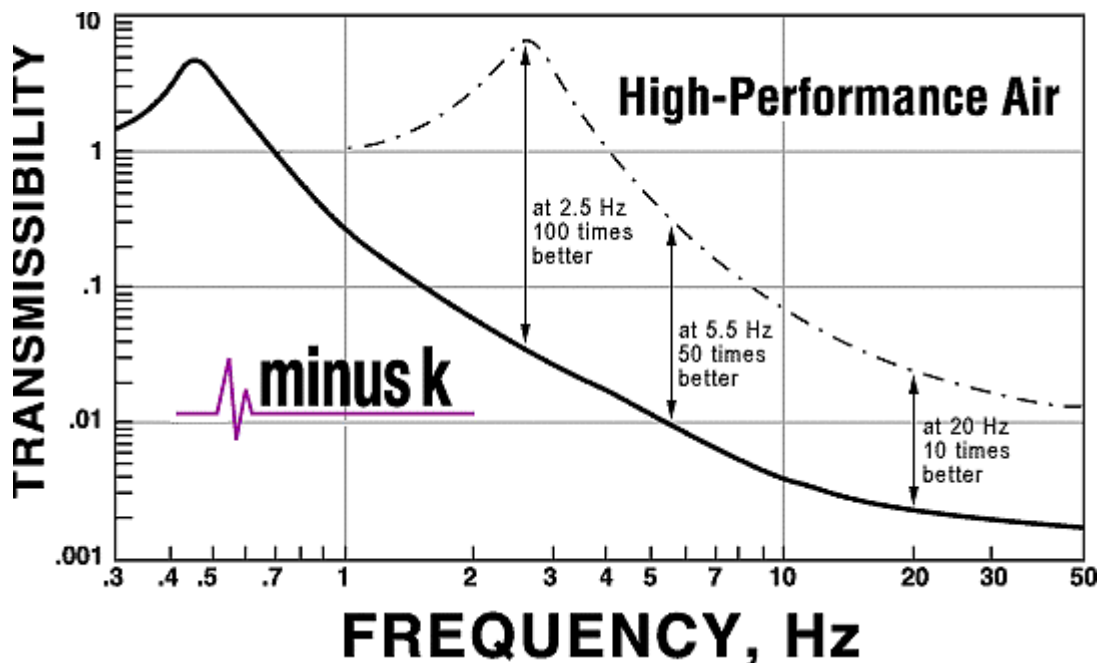
But here's the kicker. From lowest point to highest point, this takes a full second to complete the journey. One second of upward motion, one second of downward motion equal a half-second low-pass filter on vibration. If you now think that no vibrations above .5 Hz make it past the 25BM-8 platform, I don't blame you, that's what I thought. However, it's actually not the case.



Check out the above graph. It's the *transmissibility* curve of the BM-8 platform. Transmissibility refers to how well a vibration is transmitted through the platform and into the component being isolated. The graph shows the transmissibility along the vertical axis and the vibration's frequency along the horizontal axis. Notice how the transmissibility varies with frequency.

A transmissibility of one would equate to no isolation at all. As the floor moves, so does the component. It's a one-to-one ratio between floor movement and component movement. Notice that the graph shows that at the .5 Hz tuning frequency, the 25BM-8 is actually amplifying the vibration through the component - it shows a greater than one-to-one transmissibility. However, by the time the frequency rises to 1.5 Hz, the transmissibility is already down to .1. This represents a ten-fold reduction in amplitude, equating to a reduction of 20dB. By the time we reach just shy of 4 Hz, we've achieved a transmissibility of .01, representing a 100-fold or a 40dB amplitude reduction of the offending vibration. You'll also see a plateau of sorts between 25 and 40 Hz at which time transmissibility is at .001 for a 1000-fold attenuation.

You'll also notice that the graph stops at 80Hz. Keep in mind that the 25BM-8 is an industrial product mainly designed to isolate objects from structurally born vibration. Audiophiles, with the introduction of music into the room, create quite another kind of environment. Dr. Platus informs me that things get very complicated above 80Hz because we begin to have to consider resonant frequencies of associated components and even the structure of the 25BM-8 itself. In other words, while isolation is drastic, it varies from situation to situation. Keep in mind this idea of varying resonance frequencies when I start talking later about using the 25BM-8 under a turntable. Things get very interesting.



In the meantime, take a look at this next graph. You'll already be familiar with the transmissibility curve. However, the dotted line indicates the transmissibility of a high-performance isolation device using air rather than springs, such as the well known Vibraplane device. Notice that while both products amplify the vibration at some frequency, the air device amplifies it at a much higher frequency and that at 2.5Hz, the 25BM-8 has already achieved a 100-fold greater isolation and at 5.5Hz it's operating at 50 times the effectiveness of the air platform. Only by 20Hz does the air table begin to catch up but the Minus K device still has ten times greater effectiveness.

So much for the technical stuff. To help visualize how the 25BM-8 actually achieves its goal, it may be beneficial to picture an ocean liner on rough seas. We've all seen such a scenario in the movies. Multiple waves crash against the much larger ship, causing it to move, slowly, up and down. The ship's movement as it undulates up and down, fore and aft, may be great in terms of amplitude (distance traveled) but its frequency -- the intervals between the changing of directions -- is very low. In practice, the Minus K 25BM-8 platform works just like that. It's the ship on the rough sea that just happens to have your components aboard.



Place a turntable on the 25BM-8 and jump up and down on the floor. Unless you're on the basement-level concrete floor, the floor will flex, very quickly and abruptly, enough to cause a turntable's cartridge to jump up and out of the groove. But if the turntable sits upon the BM25-8, the turntable will move like that ocean liner, very slowly, very smoothly, up and down. The base of the Minus K moves abruptly below the floating platform, however no matter the abruptness of the flexing of the floor (the frequency), the 25BM-8 acts as a high-frequency filter and the component-loaded platform is oscillated at a rate of only .5 Hz. Slowly and smoothly the turntable is set into motion and slowly it comes back to rest. Not only is the cartridge/groove connection maintained, not only does the cartridge not skip, but you don't hear wow or flutter because the frequency of the vibration is beneath the response of the cartridge and the system.

The 25BM-8 also adds a significant amount of isolation in the lateral plane. Why that would be important I can't say (unless your turntable was mounted on a wall), but I'm sure that sometime soon it'll be demonstrated. The lateral (or horizontal) frequency is payload/weight dependent and is in the vicinity of 1.4 Hz at the upper end of the payload weight range. The frequency increases as the payload weight is reduced. I'm told that the frequency is 1.6Hz at 25 pounds, 1.9Hz at 20 pounds and 2.5Hz at 10 pounds.



There are two adjustments to be made when using the BM25-8. On the platform's front left panel is a crank that centers the platform within its range of motion. It's a load adjustment. Once a component is placed on the platform, if it's not weighty enough to properly depress the springs, it'll ride near the top of the platform's range of travel. If the component is heavier, it'll depress the springs and the platform will ride near the bottom of its travel (if it doesn't bottom out completely). The load adjustment has the effect of changing the preload of the springs, incrementally, so that the platform is raised or lowered to the center resting position. Why is this important? Because as the component is set in motion, if it rests near the top of its range of motion, the platform will slam against its uppermost stops. If it rests too low, one modulation will have it bottoming out against its lower stops. As it hits those stops, the jarring effect is at least as detrimental as the vibration you're trying to eliminate. In the case of turntable suspension, such a jarring action will both send audible noise through the structure of the turntable as well as pop the stylus from the groove. Centering is very important. It's also very easy to accomplish.



Before you center the platform, the center frequency of the spring mechanism may have to be adjusted. For this, the center-most adjustment is used. Using a 5/16" Allen wrench (not included), this adjustment can be rotated in either of two directions, to raise or lower the filtering frequency. The platform is delivered set to a frequency of .5Hz but as I switched between turntable and CD transport, I found that I needed to make this adjustment. One simply turns in very small degrees until the depressed and loaded platform raises again at the correct rate of speed. Minus K actually uses a metronome to make this initial adjustment at the factory. The manual warns to make adjustments in very fine degrees and this warning should be heeded. Too large and impatient a turn and you'll find yourself so well out of the proper operating range that finding it again could be frustrating. You eventually will but the situation is best avoided.

Before I get to the sonic effect of the 25BM-8 platform, I need to go through some practical ramifications of use. As compared to other products of its ilk, two very positive aspects of the 25BM-8 are the facts that the Minus K products don't make use of air bladders -- which as anybody who uses them can tell you, require very frequent adjustment -- and as it's completely passive, it won't require one of your precious electrical outlets either.



I used the 25BM-8 platform under both my CD transport as well as under my turntable. Recall my ship analogy. Now shrink the scale to that appropriate for audio components and picture them floating in your bathtub. Now picture yourself cueing a record while that turntable floats in your bathtub. If you have a top-loading transport that requires the sliding of the compartment cover, imagine sliding it open as the transport floats on water. The entire transport wants to move away from you. The floating suspension of the 25BM-8 platform gives a whole new level of complexity to changing records, too. Use of the cueing lever sets the entire turntable into motion. Even lifting the record from the platter has the effect of lifting the entire turntable slightly into the air. The component resting upon the 25BM-8 platform is effectively weightless and extremely prone to being set in motion. Stiff power cords and interconnects now have the ability to suspend the weightless component and interfere with the 25BM-8 platform's task - a real tail wagging the dog scenario. In my case, I couldn't use the Furutech Digi Reference digital interconnect due in equal parts to the cable's stiffness and the in-line filter's weight. The Rega table's power cord and interconnects, while lighter and softer, had to be configured so as to not hang directly off the edge by the turntable. Instead I routed the cables such that the bulk of their weight rested on and along the platform of the 25BM-8 and then continued on their journey from there. In a permanent situation, I can easily envision tethering cables and power cords to the wall behind or at least the equipment rack in order to relieve strain and to support the cable's weight.

Also of note is that the 25BM-8 works better when the component being suspended weighs in toward the top of the platform's payload limits. While the 25BM-8 is rated for components up to 30 pounds, it really isn't optimized for a component of as little as 10 lbs. Where exactly that cut-off is, I can't say as I have no components that light. But I did find adding some weights to the platform while the Rega was in use aided the 25BM-8 in more effectively performing its mission. Before the addition of the weights, I had a difficult time leveling the platform and zeroing in on its filtering frequency.

Lastly, it was frequently necessary to set the load adjustment when changing records because the weight of the record varies from LP to LP. A heavier LP would require a raising of the platform, a lighter LP a lowering. This was a little disconcerting at first but very quickly did I become accustomed to making the adjustment on the fly as it became part of the routine.



There's no question, the 25BM-8 added a level of complexity to the playing of both LPs and CDs that would eliminate it from consideration were it not for some practical benefits and some positive sonic ramifications. Just about everybody who spins vinyl but doesn't have the luxury of a concrete floor beneath will love at least one aspect of the BM25-8's performance. Once properly adjusted, I could jump up and down on the floor in front of my turntable with no ill effects whatsoever except for my ankles. It was actually pretty cool to watch! The turntable all but floated on air as the component rack and the bottom portion of the 25BM-8 moved -- sometimes violently -- beneath it. Of course, the Rega wasn't actually suspended motionlessly in mid air but it was moving so slowly, relatively speaking, as to almost defy detection. Suddenly my girls could dance around the room to the music while it just played on and on. If the 25BM-8 accomplished nothing else, its effect of nullifying foot falls would be enough to justify its existence in a lot of rooms.

So, how does it influence the sound? Well, it sounds great. One phenomenon that I'm unable to explain is why all reviews of cones, pods, isolating platforms and coupling spikes read so much alike and in doing so, seem to inspire conspiracy theories and accusations of snake oil. Why do they all improve the soundstage? Why do they all seem to improve bass response? Open up the treble and create a greater sense of air? I don't know. I have no idea what it is that makes the bass and treble frequencies -- as they travel through electrical components -- so fragile. But they certainly seem to be and the 25BM-8 does an admirable job of preserving them.

For sure, bass solidified when the 25BM-8 was used under my source components. It became subjectively more extended and more solid. It had greater impact as well as detail. How much better? The answer to that question will depend on how much attention you've already lavished on your system where vibration isolation or resonance tuning is concerned. If you're using a cheap stand with nothing between it and your components, then you probably can't imagine what awaits you. The change will likely be drastic.

In my system, I've been using Vibrapods for years and these little wonders work wonders. Recently I've acquired 2"-thick maple cutting boards for under my components and further improvements have been made. I've already achieved heightened levels of bass solidity, focused soundstaging and subjectively lowered noise levels. Where the 25BM-8 made additional improvements, they were indeed subtle as they were made over and above what I'd already achieved. If you think about that for a moment, that's already saying something significant.

But don't make the mistake of confusing subtle with negligible. What the 25BM-8 brought to the listening experience was never negligible. When I removed all the maple boards, pads and pods from the component and substituted the BM25-8, there were no downsides nor backsliding. That's a pretty good start. There's nothing that those treatments can do that the 25BM-8 can't. Where it came to affecting bass, treble and soundstaging, it was pretty much a wash. There were additional improvements, however. Improvements that I couldn't hope to achieve by other means available to me.



With the 25BM-8 in the system, the presentation took on a subtle yet very important increase in texture. Imagine viewing a painting behind a very clear piece of glass and then removing that piece of glass. It looked pretty good before but suddenly you can make out additional degrees of depth and detail in not only the colors but in the texture of the paint itself. This equates to microdynamics which are more highly differentiated. Not monumentally - I'm being careful to avoid hyperbole. What we're talking about is a slight yet important difference. There's no need to exaggerate the magnitude because if I were able to quantify the improvement, it could be as little as a 5 or 6% improvement. But if you've ever achieved such a subtle improvement in your system by various means, you know how monumental that added degree of enjoyment can actually be. Sometimes $1 + 1$ easily equals 5. It does so because anything that adds to the suspension of disbelief can have a logarithmic effect on the enjoyment scale. If you can relate to what I'm saying, you can also relate to the fact that once an incremental improvement is achieved, it's difficult to give up on. Often, there's no going back.

I guess the point I'm trying to make is that if you've already paid due attention to vibration control, don't insert the 25BM-8 to expect the kind of transformation that causes you to drop the book you're reading. But you will hear meaningful improvements that may be extremely difficult to achieve by other means.

If you're just starting your own battle on vibration, you may have a darn difficult time wiping that big grin off your face. You'll likely experience increases in performance well beyond what buying new electronics can produce - for a lot less money, too. Typical improvements come at both frequency extremes, plus additional dimensionality, focus and a seemingly lowered noise floor with improved microdynamics.

What I enjoyed the most about the 25BM-8 was the fact that it allowed me to see the brush strokes of music upon its canvas with vivid clarity. Again, we're not talking bang-the-door-down night-and-day differences. We're talking about subtle yet easily perceptible differences that add significantly to the sense of realism. Suddenly I could see dimensionality in the music that I never had. What had previously been smoothed over or slightly blurred now had greater texture and appreciably more appeal. What had previously sounded as smooth and texture-free as silk was now revealed with the texture of fine tweed. Breaking away from this analogy and explaining exactly what you will hear is most difficult. It relates to an incremental layering of the soundstage and imaging for starters. You won't hear things forward, middle and to the rear of the soundstage. You'll hear much greater graduation *between* those base positions. You'll hear more dimensionality to individual instruments. Even more importantly, you'll get greater delineation between blacks and grays. The listening experience takes an important step toward becoming a visual one.

The 25BM-8 comes tuned for a .5 Hz filter, which may or may not be optimal for your system. The 25BM-8 allows you to experiment and determine exactly what is right for your system. A half Hertz seemed just fine under my CD transport but under my turntable, it seemed a little low. Via rotation of the tuning adjustment, I was able to lower the BM25-8's tuning and raise it. Under the Rega, this had a very interesting effect on the sound.



Some claim (with a surprising degree of accuracy, in my view) that components sound like what they are sitting upon. To a limited extent, this was the case with the 25BM-8. Loosening up the suspension, lowering the frequency just a little bit and the music became soft and willowy. Bass seemed to lose just a little solidity and the tempo seemed to bog down just a bit. Soundstage swelled but focus diminished. Tuning the 25BM-8 in the other direction and things tightened up nicely. Focus was improved, bass became tighter and tauter and the system took on a proper sense of pace. Tightening it too much -- raising the frequency too high -- and the presentation tightened up, too. A spacious soundstage dried up though focus increased. Bass seemed tight and highly damped but lacked some of its previous oomph.

Frankly, this whole effect had me scratching my head. At no time was the Rega as firmly coupled to the shelf beneath it as when it sits on its own feet directly on the shelf. It soundstaged pretty well on its own so how could raising the frequency of the platform cause the soundstage to dry up to a greater extent than when the table was firmly coupled to a solid shelf? It seemed to me that the logical extension of this tuning phenomenon was to move the turntable from the 25BM-8 and to a solid equipment rack shelf, in which case the soundstage should completely dry up and blow away. But, of course, this is not the case.

Well, remember earlier when I was talking about the unpredictability of the transmissibility at higher frequencies? It would seem that as I adjusted the tuning frequency of the Minus K device, what I was also doing was tuning or retuning the resonant frequencies of the turntable and/or the 25BM-8 itself. As the supporting structure (the springs) became more or less stiff, it would have to effectively alter the damping effects of the loading system as it, in turn, changed the resonant tuning of the turntable and platform above. In this way, we'd moved beyond isolation and into the realm of resonance tuning. Without a doubt, the more I delved into the aspects of the 25BM-8's attributes, the more interesting things became.

Conclusion:

So there it is. From the standpoint of its impact on a system's sonic appeal, the Minus K 25BM-8 is all positive and its effects will likely come down somewhere between mind-blowing and subtle yet important - depending on how deeply and successfully you've already gotten into the elimination of vibration in your system. Due to the various weights involved and the fact that I received only one Minus K 25BM-8 for evaluation, I haven't even gotten into what can be achieved when used under preamplifiers - both tube and solid-state, and power amplifiers and DACs. In my experience, there's no component in the system that doesn't benefit from vibration reduction. If you own a turntable and particularly if you suffer a problem with having to tip-toe around your system for fear of dislodging the stylus from its groove, the 25BM-8 is an extraordinarily effective solution. I can't imagine a candidate for a more caveat-free recommendation. Would I like to own the 25BM-8 platform? Would I ever. Unfortunately, I've determined that it adds a degree of complexity in use that isn't copasetic with my reviewer's regimen of constantly changing in and out components and cables. So I have to let it go. But *you* needn't concern yourself with such things. If what I've described appeals to you, do yourself a favor and investigate the Minus K 25BM-8 for yourself. If it suits multi-million dollar laboratory instruments, it'll probably add something to your system, too.



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