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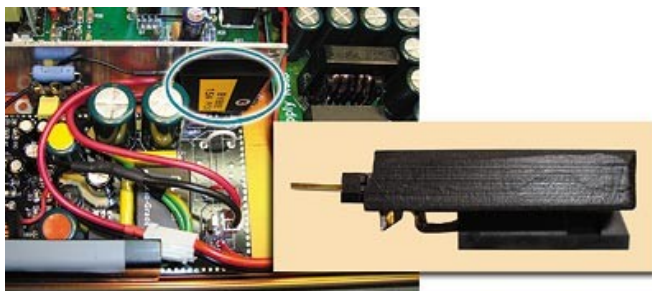
# Enjoy the Music.com

## Bybee Music Rails

Delivering unique and revolutionary quieting technology with power supply noise reduction in A/V components.

Review By Wayne Donnelly

It is a safe bet that those attending the 2011 CES/T.H.E. Show January 6th through the 9th will hear about plenty of "breakthroughs" and "revolutionary developments" – and an equally safe bet that most of the products so labeled will be no such thing. With all the engineering talent in high-end audio and the highly competitive nature of the industry, many improved products will be introduced this year, as always. But really and truly *new*? Really and truly *revolutionary*? Such finds are rare. But at least one company this time around is introducing a genuine breakthrough with an entirely new product category: active electronic filtering to radically reduce power supply noise. The company is Bybee Labs, Inc., and the product is the Bybee Music Rails.



These modules, built on small circuit boards that measurably reduce all types of noise on power supply rails, are active direct current power conditioners. The modules' very low noise floors and impedance yield highly purified DC power, measuring up to 45 dB quieter than the same power supply without Music Rails. Sonically, this uniquely original noise reduction technology produces much blacker backgrounds, faster and more impactful transients, deeper and tighter bass, far greater detail retrieval, enhanced spatial resolution, sharper and more color-intensive video images, and superior definition across the full frequency spectrum.

The primary market for the Music Rails is OEM manufacturers. The product's benefits go beyond their considerable performance improvements. Standard methodologies for creating high-performance audio components include using large banks of filter capacitors, and in tube-based gear large numbers of tubes, to achieve superior quieting. Music Rails easily perform much of the desired noise reduction, allowing OEMs multiple cost savings: by using fewer or less expensive capacitors or tubes to achieve the same or better performance, and thereby enabling physically smaller components costing less to build. The Music Rails will also be offered to qualified equipment modifiers who have the technical skills to retrofit older components and raise their performance to previously unattainable levels. The Music Rails will not be sold to DIY hobbyists.

### Product Description

A Bybee Music Rail is a very efficient polishing filter that reduces power supply noise across the audible spectrum from DC to @100 kHz. There are four different modules: positive and negative 2 Ampere and 15 Ampere. For high-voltage 15 Ampere installations additional high-voltage parts enable treatment of circuits passing up to 550V. The modules are physically compact: 1.7" x 1.4" x 0.4" (WxDxH); the additional high-voltage parts are considerably smaller. The modules are installed between the power supply rails and the load circuitry, providing 45 dB additional noise reduction compared to the unmodified circuit.



### A Tale Of Two Bybee Enterprises

Through his company Bybee Technologies, Jack Bybee has been producing his unique passive quantum purification devices for more than 20 years. Many audiophiles – including this writer – cherish the wonderfully enhanced musicality and resolution their systems gain from those Bybee devices, whether via internal mods or plug-in accessories and cables. Those products' ability to eliminate  $1/f$  noise – a form of quantum mechanical noise generated by electron flow through conductors – is unique. Although  $1/f$  noise is inaudible as such to the human ear, and cannot be measured by standard bench instruments, it has been proven that reducing  $1/f$  noise makes recorded music and video more beautiful and true to life.

Bybee Technologies has always been essentially a one-man company, dependent for growth and innovation on Jack Bybee's refusal to settle for what he has already created. With Bybee Labs, Inc., Jack is still focusing on eliminating unwanted noise. But while he is a brilliant physicist, Jack is not an electrical engineer. This time he has assembled a talented engineering and marketing team to bring this innovative noise reduction technology to an industry that can certainly use new technology with the cost-saving and performance-enhancing (and patent-protected) attributes of the Bybee Music Rails. Team members who will be in Las Vegas for the rollout include Jack Bybee, Senior Engineer Mike Vice, Jeff Wells working demos and sales, and Bybee Labs President & CEO Doug Hall, who is spearheading the new company's sales and marketing.

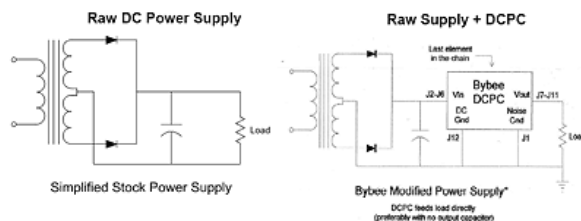
### Proving The Concept

To demonstrate the efficacy of the Music Rails, modules were installed in several components, with the ability to switch the Music Rails in and out instantly to facilitate comparisons. Those products include a pair of NuForce class D monoblock amplifiers, a \$600 tubed Music Hall DAC, and a new OEM phono preamp from Wells Audio that begins life as a \$450 JoLida phono stage.

In early November Jeff Wells hosted a listening party at his store Audible Arts in Campbell, California, where all of those components were demonstrated with and without the Music Rails operative. Attending were several audio writers and selected invitees. (I was not there, as I now live in Chicago.) I have spoken to several who attended, and their evaluations were uniformly positive – actually, euphoric is probably a better adjective. Subsequently I was able to listen to the Wells Audio phono stage, which was dazzling. (Jack Bybee has also listened to it, and pronounced it superior to his fully updated Vendetta Research phono preamp.) From all reports, those attending the event in Campbell were virtually unanimous in their amazement at the degree of improvement heard on every upgraded component, and several immediately requested having Music Rails installed in several of their components.

Chatting with Jack Bybee about that event, I asked if they had tried the Music Rails into any expensive state-of-the-art components. They had not as yet, but Jack was eager to do so in order to ascertain whether the Music Rails' ability to make inexpensive components compete with big-ticket stuff would be as impressive in a nearly \$20,000 preamplifier. That's when the light bulb lit up in my head.

As regular readers may recall, the VTL TL 7.5 line preamplifier has long held sway in my system. I reviewed the original years ago, and re-reviewed the Series II in December 2009. But in 2010 I reviewed – and fell in love with – the Einstein "The Tube" line stage from Germany – so much so that I decided it was finally time to replace my VTL. When I gave the Einstein a 2010 Blue Note award, I wrote, "This is now my reference preamp." But, given the Einstein's \$18,500, I asked Einstein distributor Brian Ackerman to give me time to sell the 7.5 first, and he generously agreed. But subsequent medical complications had delayed my selling effort, so I still had the 7.5.



Jack and I decided that if time permitted I would install Music Rails in my 7.5, evaluate the differences, and write up the trial in time for 2011 CES/T.H.E. Show. But there wasn't much time to get everything done. I called my friend Beatrice Lam, the better half of VTL's ownership couple, to discuss the possibility of VTL doing the Music Rail mod. It seemed like a long shot, as end-of-year business and CES preparations would likely not give VTL time for learning an unfamiliar process, completing and testing the mod, and shipping back and forth. Bea confirmed those assumptions, so I needed a new plan.

Fortunately, in Chicago I can call on a talented and experienced engineer, Karl Szczypta. Karl worked with Scott Frankland to determine the number of modules and the correct insertion points. Because the 7.5 is internally dual-mono, each channel had to be modified independently. But on the other hand the 7.5's extensive power supply regulation – comprising 12 independent power regulators – required fewer modules. In total Karl added two Positive 2 Ampere modules on the tube filaments and two Positive 15 Ampere modules and two high-voltage kits in the high-voltage sections of the circuit.

My Music Rail-equipped VTL 7.5 was reinstalled on December 12, and as I write this it has been playing 24/7 since then, accumulating the 200+ hours of playing time I wanted to ensure full burn-in on the modules before critical listening.

### Listening To The VTL 7.5 + Bybee Music Rails

I felt an excited anticipation while re-installing the modified 7.5. I was eager to find out if the Music Rails had improved it enough that I might not need to switch preamps. I realized that I really wanted to keep the VTL because it is the ideal reviewer's preamplifier.

Here's why. The 7.5 provides more comprehensive connectivity than any other preamp I have used – several more inputs and outputs than I normally need, and each of them has both RCA and XLR jacks. Plugging in new review gear does not mandate disconnecting anything in my regular system. If I want to do instant A-B comparisons between, say, two CD players, I can not only connect both simultaneously, but also use the level-matching feature to ensure identical playback volumes between the two.

The 7.5's rear panel is so logically and clearly mirror-imaged that in spite of my quite impaired vision I can unerringly reconfigure the system and get everything right the first time. That's ergonomics! Even more important in day-to-day listening is the wonderful user interface. The 7.5 has a great remote wand – sturdy aluminum, comfortable to hold, and with an intuitive layout I can easily use in pitch darkness – that lets me do everything I need to do in a listening session without leaving my sweet spot: source selection, balance control (out of the circuit unless activated, of course), volume control and... drum roll please... polarity (often called "phase") switching. Let me digress on that last point.

I have long been puzzled that the majority of even very expensive and ambitious preamplifiers omit polarity switching. There being no industry standard requiring consistent polarity, either in the recording process or in playback equipment, this easy way of optimizing music listening is generally ignored by both equipment manufacturers and supposedly golden-eared audiophiles. It's true that on multi-mic'ed recordings with post-production mixing, polarity can be unclear. But on minimally mic'ed, more "purist" recordings – e.g., those fabulous Mercury Living Presence classics from the '50s, or virtually anything from the Harmonia Mundi distributed labels – correct polarity sounds more natural than incorrect polarity. Like so many state-of-the-art preamplifiers, the Einstein lacks polarity switching. I had convinced myself that because it sounds so good generally – even out of polarity – that I could live without the polarity flip. But I'm happy that now I don't have to.

Now, with the heightened resolution of the Music Rail-equipped 7.5, I hear an even more distinctly audible difference between right and wrong polarity. When it's right the music simply sounds more natural and relaxed.

End of digression. The 7.5's features are thoroughly covered in my previous reviews and on the VTL website. The rest of this commentary considers the nature of the sonic improvements related to the Music Rail installation.

### Details, Details, Details

**Transient Performance:** Perhaps the most immediately noticeable change is in the speed and impact of leading-edge transients. On piano, to me the toughest test of an audio system, I now hear a more physical weight from the leading edge of the hammers striking the strings, especially from the left side of the keyboard. But every leading-edge transient is affected. It's not surprising to have a bass drum strike rattle my breastbone, but it is a new thrill to perceive so clearly the attack of a trumpet or the strike of a violin bow on a string. The heightened transient capture is one of the key factors in the more vivid "in the room" quality I now hear.

**Detail Retrieval:** I have often heard systems which seemed to "throw" detail at me, aggressively and more forward-sounding than with live music. My system has always been blessedly free of that aggressiveness, and that is still so. But within its essentially neutral presentation the system is now revealing new levels of microdetail. Patricia Barber's *The Cole Porter Mix* is one of my touchstone jazz vocal recordings, and I have played it probably at least 100 times. I was stunned when I first played it post-mod, as suddenly Barber's smoky voice was embellished with faint vocal cord quivers and breaks in the phrasing that I had not previously perceived. There were more new discoveries in this beautifully balanced recording – delicate brushwork on the drums, subtle picking on the electric guitar... every track on this much-loved CD sounds burnished clean and clear, startlingly improved. The

same holds true in large-scale music. My favorite orchestral recording of the past year, *Britten's Orchestra* on Reference Recordings, now reveals myriad felicities of phrasing and attack that surpass even its former sonic glory.

**Dynamics:** Dynamic scaling is now truer on both the micro and macro ends of the scale. This is really another way of looking at the improvements in detailing, another manifestation of the significantly enhanced resolution at all frequencies and all intensities of phrasing.

**Bass Response:** Bass is now so powerful that the 20 Hz pedal note in the Saint-Saens "Organ" Symphony causes the bass panels in my Analysis speakers to flutter against the grill cloth lining. Yikes! That's some excursion for a big planar! Beyond that momentarily disconcerting instance, it is easy to hear the improved pitch definition on good orchestral recordings, clearly separating low strings, brass, woodwinds and voices.

**Spatial Resolution:** An already superb soundscape is now both larger – clearly extending farther outside the speakers than before, and becoming deeper – and with more precise individual image locations within the stage. On great orchestral and choral recordings, it can sound almost as if the ensembles are beyond my back wall and located in the street outside my building.

### Summing It Up

Beyond all these checklist considerations, what it boils down to is that the system is simply more compelling to listen to. Reviewers often try to quantify upgrade results. You know, "with component X I heard a roughly 10% improvement." But I don't think that kind of calculus works here. Adding the Music Rails to the 7.5 has changed fundamentally the nature of the system's sound. I have said in the past that Jack Bybee's quantum purifiers moved my system away from sounding "electronic" and toward natural musicality – and that's a pretty good way of looking at the Music Rails results as well.



And here, for me, is the clincher. I like sometimes to crank up playback volume to, let us say, *unwise* levels, to be engulfed in the music. The volume display on the 7.5 occasionally used to creep into the 90s, approaching full gain. But during this evaluation of the Music Rails, the highest readout I've seen, when I'm in that total immersion mood, has been 80! I had no reason to think the Music Rails would increase the preamp's gain, and Scott confirmed that they do not. Yet I get that same feeling of engulfment in the music that used to require going into the 90s. This remarkable degree of change would seem to be related to the enhanced vividness and information retrieval resulting from purifying the power supply of the 7.5. Given the context, and keeping in mind that my Chicago Loop building is at ground zero for this city's massive RFI/EMF saturation, I conclude that until now I've been fighting that problem with only partial success. I'd suppressed the noise below obvious audibility, but the system must still have been playing over residual power supply noise. Otherwise, why do I now perceive the sound as equally as loud as before with the volume level now set lower?

In no way do I want to denigrate the superb sound of the Einstein preamp I was ready to buy a few weeks ago. It sounds as gorgeous as ever, and some listeners might still prefer it to my reborn VTL. But for me, the Music Rails have taken the 7.5, and the system, to a kind of naturalness and ease that I hadn't yet dreamed of.

Over decades of involvement with audio it has become increasingly apparent to me that power supply excellence is the biggest contributing factor in the sound of great components. The potential this technology holds for new generations of moderately priced, high-performance home entertainment gear is exciting to contemplate. I hope the all-too-common aversion so maybe designers have to adopting "not invented here" solutions will yield to the reality of this golden opportunity to get better sound for less money. And here's a thought that just popped up: Imagine the fabulous recordings that a Music Rail power-purified recording facility could turn out. Kick out da noise, bring in da music! Meanwhile, my heartfelt thanks to Santa Jack and his merry engineers for my best Christmas present ever!

### Moving Forward

Bybee Labs, Inc. is now recruiting OEM and modification partners to bring this new technology to the audiophile community. Pricing still has to be finalized, and installation guidelines for modifications are being created. Show visitors will receive a packet that includes a very informative Scott Frankland white paper on how the Music Rails work; it may also be requested at their website. As OEMs and modifiers sign on, they will also be listed on that website.

### Specifications

Type: Power supply system modification  
Low Noise Floor: 20nV/root  
Low Output Impedance: 6mOhm typical  
Wide Voltage Range: 4.5-550V  
High Current Range: 0-2A / 0-15A  
Low Dropout Voltage: 0.5V / 2.1V  
Low Dissipation: 1W / 31.5W  
Direct-Coupled Topology  
Small Footprint: 1.7 x 1.5 x 0.4 (HxWxD in inches)  
Price: Not finalized

### Company Information

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