

Know Your Rights Before You Release Your Music!

RECORDING

The magazine for the recording musician

Recording Done Right

CELEBRATING
25
YEARS

Producing Pro-Quality Tracks In Home Studios

All about running a successful record label (and recording its music, too)

Toby Gad

The Grammy®-winning hitmaker shares his songwriting secrets!

World-Class Gear! **19** Products Reviewed:

A-Designs • Adobe • Alesis • Audix • Blue • Electro-Voice
Fable Sounds • Grace Design • Great River Electronics
Millennia Media • Radial Engineering • Telefunken...
...and the triumphant return of Pultec!

\$5.99US \$5.99CAN 10>



0 09281 03050 8

VOL. TWENTY FIVE
NUMBER ONE
OCTOBER 2011
USA \$5.99
CANADA \$5.99



REVIEW

BY PAUL VNUK JR.

Radial Engineering Workhorse And Modules: JDV-Pre, Shuttle, EXTC, and PhazeQ



Can an effects rack enclosure also be an audio revolution?

Radial Engineering is a Canadian company best known for its extensive line of battle-ready direct boxes, re-ampers and utility devices. The company makes a style and model for almost every input/output situation you can think of, and even a few you can't.

Radial's latest venture is the Workhorse, a rack enclosure for 500-Series effects modules that adds mixing, summing, and routing features never before seen in a rack of this type. Side by side with the Workhorse is a brand new line of 500-Series modules; they're designed for use in Radial's Workhorse chassis and offer extra capabilities when used with it, but can also be used in API's rack and "lunchbox" enclosures and those from other makers as well.

The Workhorse

This is a 3-space 19" rack enclosure with room for 8 modules. It is constructed of the same thick steel casing as Radial's direct boxes and is finished in the same high-gloss baked enamel.

Every knob and button is smooth, yet firm, the circuit boards are thick, clean and neatly laid out, and the inputs and outputs are of the highest quality. In other words—it more than lives up to Radial's reputation for roadworthy toughness.

The Workhorse has plenty of power (1200 mA) for vintage and modern high-powered modules, unlike some older API-

style enclosures; my older "lunchbox" had to be custom-modified to work reliably with many of the newer 500-Series modules I often review. To make room for all the extra features of the Workhorse, most of which are where an internal power supply would traditionally be located, Radial chose to go with an external line-lump power supply.

Flexible I/O

Most 500-Series enclosures are simple, utilitarian boxes that offer a single XLR input and output per slot. In contrast, The Workhorse offers a host of choices to fit most every hookup and patchbay situation. On the rear of the unit each slot has a balanced XLR, a 1/4" TRS, and even 25-pin (8-channel) D-Sub inputs and outputs.

Each slot also has an additional 1/4" TRS jack which Radial calls the Omniport. This adds additional module-specific connectivity and function when used with Radial's modules. Radial has made these specs available as open-source, should other companies wish to adopt this functionality in the future (a few builders such as Grace Design are already reporting that they have Omniport-enhanced products in development).

The back of the Workhorse has the external power socket, studio grounding lugs, and the inputs and outputs for the summing mixer, which we will look at in a minute. Several Workhorse racks may be chained with a set of dedicated TRS connectors.

Links and feeds

Before we move on to the mixer section, however, I need to point out two additional switches located on select slots that add important features when desired.

The first one is a stereo link switch located on slots 1, 3, 5 & 7. This switch allows you to couple pre-equipped modules (most often compressors) for stereo use. This feature has been available for a while on older API racks, but there it requires the internal soldering of a jumper, so this Radial implementation with an easy-to-reach switch is much simpler and most welcome.

The other switch is the Feed Function, available on slots 1–7. This is one of those "Why didn't somebody think this of this before?" features. As its name implies, it takes the output of one slot and feeds its signal into the input of the next successive slot. This lets you create your own channel strip and custom recording chains internally without the use of jumper cables.

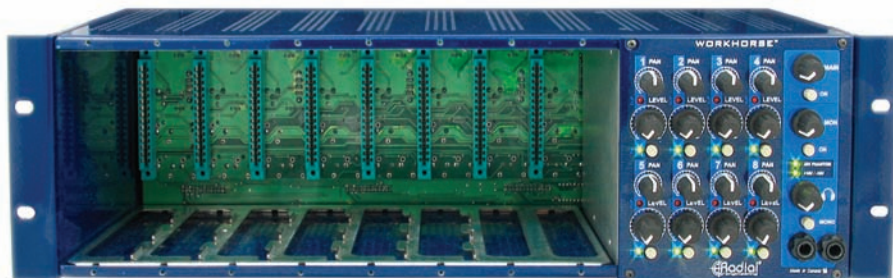
Mixer section

The Workhorse's mixer section is a full-featured 8-channel summing mixer or internally bussed monitoring system, with 19 knobs, 11 push buttons, dual headphone outs, and more.

Each of the eight channels has its own volume and pan knob as well as a clip



Radial Workhorse And Modules



LED and an on/off/mute switch. The mixer's master section has three stereo outs, each with its own level control: main, monitor, and headphones.

The mixer section's backside features another D-sub connector for the summing mixer's 8 input channels. The main output section (with isolated Jensen transformers) has balanced 1/4" TRS and XLR stereo outputs and a pair of 1/4" TRS insert points. The monitor output section, identical to the main out section, has no inserts. The duplicate headphone outs are of a high-output design, and they offer a handy mono summing switch for checking phase and such.

Rack niceties

At this point you may be wondering, "I thought this was a 500-Series rack and there has been little to no talk about how it handles said modules."

Simply put, you put the modules in the rack and they work, and thanks to yet another of the Workhorse's unique features, it literally is that simple: The Workhorse comes with a handy internal tray with small guide rails that helps to line up the modules properly with the rear sockets. For anyone who has fussed with seating a module in an enclosure before, this is another welcome feature.

The tray is set up to fit single modules in the first 6 slots and a double in the last two—that last slot was where I installed the Great River mic preamp reviewed elsewhere in this issue. If this configuration

does not work for you, that's OK as the tray is removable.

In use

I filled and tested the Workhorse with modules from Great River, Chandler Limited, Millennia Media, and of course Radial, and it was a solid performer with them all.

The only word of caution I can offer is to make sure when you are setting up and wiring your rack that you only have the Feed switches activated when and if you need them. I could not understand why one of the mic pres was so noisy, until I crawled behind my desk to discover that the Feed switch from the module in front of it was on, and its input volume was cranked all the way up!

It's strange to think of a 500-Series rack as having a learning curve, but this one kind of does... not so much in how it works, but more in how you want it to work for you. Do you want a summing mixer, a tracking rack of 8 mic pres, a pair of channel strips with a pre, eq and comp? Luckily Radial provides a healthy selection of setup suggestions, both online and in the manual (www.radialeng.com/pdfs/wh-users-guide.pdf), to help you conceptualize and map out what will work best for you.

All of my own 500-Series modules (so far!) are equalizers, so I really have no need for the internal bussing, but with the right modules this unit can become a tracking mixer, complete with a latency-free cue mix from your DAW.

I spent some time testing out the summing mixer, and it exceeded my expectations. I am not a person who buys into the whole summing mixer fanaticism on the internet as a "better-or-worse-than" scenario—I'm more of the "slightly different" scenario persuasion—but I will say that the Jensen transformers on the outputs give the unit a nice subtle personality that I quite liked.

You will need to watch your DAW's output levels, as it is very easy to overdrive the inputs with hot digital-zero signals. This unit sounded the sweetest when my average signals were around -12 dB, occasionally peaking at -6 dB. Now on the other hand, like a good analog device, you can drive the inputs for some analog saturation and distortion if you want, but I liked it better with more openness and headroom.

Lastly, even though it looks and functions like a basic line mixer thanks to its gain and pan pots, their layout makes them a tad cramped for actual active mixing.

Conclusions

The Workhorse is a huge step forward in the 500-Series world, and from its build quality to its feature set and its open-ended architecture, it is currently unrivaled for supremacy. Simply put, even if you take the summing mixer away (and you can—see below), no other 500-Series rack even comes close.

Of course all innovation comes with a cost, and with the Workhorse that cost is \$1399 street. Compared to API's own 10-slot 500V which streets for \$800 it's a pretty steep difference. Now if all you want is a 500-Series rack, the good news is Radial does offer the Workhorse without the mixer, also for around \$800, so for the same money the decision comes down to build quality and feature set vs. possible number of modules. The mixer can be purchased and installed separately as an add-on at a later date.

Looked at from the other end, the Workhorse is a Jensen-equipped summing mixer that also happens to be a 500-Series rack. As such, when compared to most other summing boxes, it's a flat-out *bargain!*





Radial Workhorse And Modules



500-Series Modules: JDV-Pre, Shuttle, EXTC, PhazeQ

To date Radial's new module series includes:

- JDV-Pre Instrument Preamp and DI
- Shuttle Insert Loop
- EXTC Guitar Effects Interface
- PhazeQ Adjustment Tool
- JDX Reactor Speaker Simulator
- X-Amp Reamper
- PowerPre Mic Preamp
- Komit Compressor Limiter
- Q3 Coil Equalizer
- Tank Driver Reverb Tank Input

The Q3 and Tank Driver are so new that they're not even on Radial's website yet; they, and many of the other modules listed here, will be reviewed in upcoming issues of *Recording*. In the meantime, I'm supplementing my review of the Workhorse with a look at the first four modules on our list. These are general-purpose modules that extend the Workhorse's flexibility and help turn it into a comprehensive solution for mixing and routing processed audio.

The modules are, as expected, built to Radial's high standards. Each model is fully enclosed in a steel case and the faceplates feature the same thick steel and baked enamel finish as the Workhorse. The knobs and switches are again first rate.

JDV-Pre

First up we will look at the JDV-Pre, which is a 500-Series adaptation of Radial's already respected JDV active pre amp. While the original (now in its MKIII version) is essentially an active direct box with a plethora of outputs for the studio and stage, the 500-Series version really focuses on being a true instrument preamp. Taken from the original is the 100% discrete class-A signal path with a transformer coupled, feed forward input as well as the Drag control. For a discussion of what Drag is and how it works, check out Mike Metlay's review of the Radial Dragster in our July 2011 issue, and the quote from the Radial website on page 44.

Additional features include phase invert, a fully variable highpass filter from 5 Hz to 2 kHz, AccuState gain control that adjusts the gain and input sensitivity automatically for low noise operation, and signal, peak and power LEDs.

Instrument pre amp with a twist

While its lineage would suggest that this is simply a rackmounted DI, it's really a preamp in every sense of the word, only unlike a typical mic pre that happens to have an instrument

input, this is an instrument preamp which happens to have a microphone input.

On the instrument side, this preamp is made to handle both piezo and magnetic pickups, and thanks to its innovative Drag feature, you can adjust the input to the correct impedance load of the pickups.

On the microphone side the JDV-Pre offers a clean solid phantom-powered mic pre made primarily for use with instrument-specific condenser mics, many of which either clip on or are built into acoustic instruments. It will work with most any mic, but its +46 dB input gain is not well suited for dynamic or ribbon mics.

For accessing these features you have a pair of front-mounted 1/4" jacks, one for input and the other an auxiliary output or thru which can feed an amplifier or a tuner. The mic input is on the back, i.e. it's the 500-Series rack's XLR input for that slot.

The Omniport function for this module is a unity output that takes the JDV-Pre back to its roots, providing a balanced low-impedance direct-box output.

Comments and conclusions

While many of these features are commonplace in the DI world, in a 500-Series module they are pretty much unheard of. As I mentioned, this is not just your typical obligatory Hi-Z instrument input; it's a purpose-built device made to get the most out of your instrument's pickups. Now unlike a tube or vintage mic pre like, say, a UA-610, this is not a thick vibe piece either. Sonically it is solid and forward and manages to capture the instrument's tone in a very pure and 3-dimensional way.

Just recently a client of mine needed to do a quick guitar overdub on a song, and since we were in mix-down mode there were no amps set up. With the JDV-Pre we plugged in a 1960s reissue Telecaster and adjusted the Drag until we got the tone we wanted. A few chorus and delay plug-ins later and we had a lush, clean guitar tone that put smiles on everyone's faces.

I need to single out the Drag feature because in my opinion this module is worth it for that alone. While it initially sounds like it is eq'ing the sound, it adjusts the impedance load on the pick-ups and alters the solidity of the guitar's tone. It reminds me a bit of the Zvex S.H.O. pedal, but whereas that pedal's impedance load is fixed, being able to adjust said impedance or drag to taste is even handier.

Again not just a mere instrument DI for the 500-Series universe, this box is essential if direct-injected guitars and/or bass are a staple of your work. Its presence and cleanliness are sure to impress.





Radial Workhorse And Modules

REVIEW

EXTC

Shuttle

In simple terms, the Shuttle turns any piece of outboard equipment into a 500-Series module and, on the Workhorse, allows you to inject any external device into its mix bus. How does it do this?

Connections and concepts

The layout of the Shuttle is deceptively simple. You get a pair of unbalanced 1/4" (send and return) jacks for -10 dBV operation and a pair of balanced +4 dBu 1/4" jacks. Each has its own insert toggle button for taking the device in and out of the signal chain for audition purposes.

Radial's website, in its description of the Dragster, explains the Drag function also found in the JDV-Pre:

"The Dragster is a load-correction device designed to restore full, rich tone [...] whenever a guitar is connected to a buffered input [...] [It] lets you dial in the perfect impedance for the most natural sound. Result? Your guitar tone regains its warmth—it feels 'right' again and your performance sounds great!"

The Omniport on the Shuttle acts as a traditional channel insert with a standard TRS Y-cable. It is engaged via a front-panel button and allows you to add an additional eq or compressor into the Shuttle's chain, in other words adding an insert into an insert.

Why would I want to do any of this? That was my first question, and the answer comes down to how you have your Workhorse set up and what its function is in your studio.

In a tracking scenario you could use up to six mic pres for tracking, and then use a pair of Shuttles to take in a stereo mix feed from your DAW. With the Workhorse's monitoring section and dual headphone outputs this would give you a latency-free submix for the musicians.

Or, if you have a small 500-Series-based home studio you can use one or more Shuttles to insert additional 19" rackmount processors and effects into the 500 series chain without the hassle of a patchbay. Essentially this is a simple and elegant bridge between 500-Series racks and traditional audio gear, and allows easy access for external gear to the Workhorse's bus system.

In use

In my studio I use a TT/D-sub-based patch bay, and as such hooking up some of my older 1/4" I/O effects, like my Alesis Wedge reverb, is usually a hassle. But with the Shuttle, my Wedge effortlessly became a 500-Series reverb unit.

The Shuttle is one of those devices you may not know you need until you need it. If you are a 500-Series fanatic, then this piece could be a real no-brainer for interfacing other traditional studio gear without patching acrobatics or potential level-mismatch hassles.

The EXTC is similar to the Shuttle—another 1/4" send/return patching device, but this time with focus on Hi-Z guitar effects pedals. The EXTC is part Hi-Z direct box and part reamp device rolled into one. With this module you can now effortlessly (and better yet, correctly) blend stomp box effects into your mix.

The EXTC is equipped with one 1/4" unbalanced send and one 1/4" return that interfaces directly with your pedals. Each has its own trim pot to allow you to correctly set gain staging with your pedals.

The EXTC also has a master wet/dry Blend knob and a 180-degree phase switch. The EXTC's Omniport functions similarly to the Shuttle's and allows you to place an insert device into the signal chain with a standard TRS-Y cable.

Personal EXTC

After looking at the prototype at the NAMM show, I was excited to get my hands on an EXTC. As a sound designer and electronic musician, I love adding the uniqueness of stomp boxes into my mixes. With the EXTC I no longer need to pull out a separate DI and a Reamp box to get effects pedals into my DAW. Now if you are thinking, "Can't I just use the send and returns on my mixer just like any other effect?"—the answer is: Yes, you could, but the gain staging and, worse yet, the impedance load would be wrong. While it may work, it just won't sound as good as it could.

When you use the EXTC with the Workhorse's mix buss and channel feed design, you can record and track your guitar and stomp boxes normally, but by starting with the guitar into the JDV-Pre and fed into the EXTC and then followed into the



Radial's X-Amp Reamper (which we will look at in our upcoming February 2012 guitar issue) you can track each section separately along with a miked amp cabinet, allowing for huge flexibility during mixdown.

With EXTC you can add stomp-box distortion to a vocal, a vintage phaser pedal to a drum fill, your favorite chorus pedal to an acoustic guitar track, and the list goes on. If you use a lot of guitar effects and are always on the lookout for the cleanest and most flexible way to add them to your tracks, the EXTC will leave you in... oh, you know.

PhazeQ

The PhazeQ is another adaptation of a previous Radial favorite, the Radial Phazer that we reviewed in our November 2009 issue. This is not a 500-Series phaser effect, but a continuously variable phase alignment and adjustment tool.

Similar to the phase button on a traditional mixer, it is used to adjust the phase between two sounds, most typically a pair of mics or a combination of a mic and a direct-injected signal. Examples include drum overheads, top and bottom snare mics, inner and outer kick drum mics, dual-miked guitar cabinets, and simultaneous direct and miked bass guitar. But unlike most phase switches that offer a single 180-degree phase flip (actually a polarity inversion, to be technically correct), this unit allows you to precisely dial in the correct phase amount with complete accuracy.

Controls and connections

The PhazeQ, like the Phazer, is comprised of two sections. The first is made up of a single knob that smoothly adjusts the phase from 0 to 180 degrees and in-between. There is also a traditional 180-degree flip button and a bypass button. Using the knob and flip button in tandem actually allows you to adjust the signal up to a full 360 degrees.

The second section is a variable low-pass filter section with switchable frequency ranges of 3 to 38 kHz or 300 Hz to 3.8 kHz. This gets you only apply phase correction to the lows; to my ears this helps get rid of unnatural high-end brittleness and helps define the low end. Unlike the original Phazer box, the PhazeQ also has a master wet/dry knob; you can therefore create your own phase cancellation effects right in one box. Finally, the PhazeQ's Omniport function is a simple dry output signal.

Correct and effect

Not just handy for adjusting and fixing phase coherence, the PhazeQ also makes a unique and extreme equalizer

with a sound akin to moving mics purposely in and out of phase on a source. Even handier is that this can be accomplished not only during tracking, but also after the fact during mixdown.

As reviewer Fernando Curiel mentioned in his review of the original, "this is one of those [Radial] devices that will solve problems you did not even know existed." Whether used to tighten up your tracks or as an effect, this is another one of those utility pieces that it never hurts to have in your arsenal. ☺

Prices (street): Workhorse, \$1399; Workhorse without mixer, \$749.99; JDV-Pre, \$399.99; Shuttle, \$139.99; EXTC, \$249.99; PhazeQ, \$299.99

More from: Radial Engineering, www.radialeng.com

Paul Vnuk Jr. (vnuk@recordingmag.com) is a recording engineer, sound designer, and musician living and working in Milwaukee. Learn more about what's going on in his studio at www.majale.com.