



## Radial Workhorse

**A long time in the planning and a long time in the coming, Radial's individual take on the 500 Series module frame is with us. GEORGE SHILLING believes the wait has been worth it.**

Radial is known mainly for its huge range of high quality interface boxes including DI boxes, Re-Amping devices and similar problem-solving boxes for musicians and engineers. The Workhorse takes things into a different realm (*Resolution* V9.5); it is an API 500 Series-compatible rack host for up to eight compatible modules. However, rather than just providing a power supply and eight slots, the Workhorse includes some innovative routing features, and furthermore includes an 8-channel stereo bus mixer on the front panel.

If you have ever encountered a Radial DI box (*Or dropped one on a sandalled foot. Ed*) you'll know that they are built like tanks, and the Workhorse is no different. The 14-gauge steel case is finished in baked enamel like the other Radial gear, with a tough dark blue finish that should wear well. Mil-spec double-

sided PCB boards with 'full surface ground plane' are meant to ensure signal purity and reduce noise and crosstalk. Radial is expert at eliminating hum and noise from guitar signals, and in the Workhorse that knowledge has been put to good use.

Out of the box the Workhorse is provided with a thin plastic blanking sheet across the front of the module slots, embossed with tantalising graphics of some Radial modules. This is intended to be cut to size to blank off unused space after modules have been installed. There is space for eight individual modules or four double-width (stereo) modules. In the base of the module section is an 'Easy-Guide Tray' that allows modules to rest on it and address the edge connector at the correct height. I had four supplied Radial modules easily installed in minutes. Behind the front panel, modules' widths may vary between

manufacturers, so the tray won't necessarily align the sideways positioning, but there are small tags to roughly align four modules on the left and two double-width modules on the right. Or you can remove the tray and reinstall it 180 degrees around for double-width modules on the left and single modules on the right. Not all 500 Series modules are exactly the same shape and size, so for such non-standard modules or any other situation where the tray gets in the way, it is easily removed with two screws. Hot-swapping of modules is not recommended and not covered under warranty, but I gather that the designers have taken precautions against damage in case of an accidental hot-swap.

Power is fed from an external plastic-encased in-line transformer with an IEC inlet and a flying lead ending in a sturdy 5-pin XLR socket that connects to the rear of the Workhorse. There was no space left in the rack for the power supply, but making it external helps eliminate noise and interference, and a dud is easy to replace. The PSU happily copes with any international voltage; this provides oversped 48V phantom power for modules requiring it, and a healthy 1600mA of which 400mA is assigned to the mixer section. The rest can be used by modules as necessary and this is a generous rating that should satisfy greedy tube preamps and suchlike. Chassis and Circuit ground have individual binding posts on the rear, these are connected with a tie-bar but this can be modified as necessary for star-ground wiring arrangements.

The mixer on the right of the front panel can be addressed by any 500 Series modules that provide an output on the correct edge connector pin. Radial's own rapidly expanding 500 Series range currently comprises eight models, these are the PowerPre mic preamp, JDV-Pre, JDX DI-box, X-Amp Re-Amp unit,

EXTC Guitar Effects Interface, PhazeQ phase alignment tool, Komit compressor-limiter and the Shuttle insert and routing module (more of which separately). For older modules and those that don't support this function, the eight mixer inputs are accessed using the 25-pin (Tascam/Pro Tools wiring format) D-Connector labelled Summing Mixer Inputs 1-8. Usefully, Radial has also provided D-Connectors for all modules' I-Os.

On the rear of the module section, customary input and output XLRs are provided for each slot. These are doubled with useful parallel-connected TRS jacks. And indeed tripled with the aforementioned D-Connectors. There is also an additional 'Omniport' TRS jack socket. Radial provides this bonus connection to facilitate module-dependent functions that it has implemented on some of its own modules (*And could be implemented on the modules of others. Ed*). For example, this functions as the Instrument input for the Power Pre and X-Amp modules, and the Compressor key input for the Komit.

Between each channel on the rear is a switch labelled Feed. This sends the output of the lower numbered channel to the input of the next one, making for neat chaining of modules together without any cabling. You can therefore easily construct a custom channel strip from different mic amp, compressor and dynamics modules, and as long as they're plonked into the rack in the right order you will only need input and output connections. And in-between each pair of channels is a Link switch for connecting modules that have a stereo link function. This uses the standard API master/slave configuration. It would have been nice to have both these functions on the front, but space and the constraints of the 500 format precludes this.

The 'virtual ground bus' (a principle used on large format analogue consoles) stereo summing mixer at the right of the front panel is a very straightforward affair operationally. Rubberised knobs in the Radial house style are arranged in two banks each of four channels with Level and Pan controls, uncalibrated but with a nicely damped feel. Little On buttons for each channel are accompanied by a relay click and a green LED. These actually feed two stereo buses, each with its own master level pot and On button. The main bus features Jensen transformers, which lend the summing a clean yet naturally warm vintage sound. They also provide isolation from noise, of course, and that might prove particularly useful in live recording situations.

Bus outputs are provided on XLR and TRS balanced jacks. Insert points (unbalanced TRS) are provided before these. Driving the transformers hard, which is possible by turning the gains very high, crunches them slightly in a not unpleasant manner — they are very forgiving in a good old-fashioned analogue manner. DAW outputs can be plumbed into the Summing D-Sub connector, the Workhorse coped fine with fairly hot Pro Tools levels.

Alternative to the main output is the 'monitor' bus which taps the signal before the transformers for a cleaner IC-balanced path, and this also appears as XLRs and TRS jacks. A third parallel stereo bus is provided for the two headphone jacks on the front panel. There are no On buttons for these, but instead a handy Mono button is provided for signal checking. The headphone amplifier is one of the most powerful I have ever come across, so great care is required when using these outputs. I had the volume knob down at about 8 o'clock providing me with plenty of signal. I imagine though that in a live situation, or with less sensitive headphones, some of the extra power might come in useful. Back on the rear panel, four further (unbalanced) jacks provide the Expansion Bus stereo input and output. This is compatible with Rupert Neve Designs' Portico busing system, and allows for chaining further Workhorses to increase the channel count in the mixer. The mixer is easy to set up and use, the only thing lacking I would have liked is some better metering, even just varying coloured LEDs would be better than the simple overload indicators that are provided; realistically there is no room for anything else!

Applications for the Workhorse are obviously dependent on the installed modules, but you can envisage uses such as a rack full of mic preamps with their direct outputs going to a recorder,



while using the summing mixer to balance them for monitoring, or even mixing them for a 'straight-to-stereo' mix. Bringing in a stereo DAW output to two channels would make it easy to set up a monitoring balance for overdubbing. I had some fun plugging a guitar into the front of a JDX DI in the rack, then routed this into a Power Pre module easily using the Feed function, while using the summing mixer separately to bring up a monitor mix. With multiple outputs on the back, it is easy to provide feeds to DAW, monitoring or even FOH/PA for a live setup.

Radial's own range of brightly-painted modules is ever-expanding, and of course these take advantage of the busing and Omniport features of the Workhorse, which provide extra functions and flexibility. Musicians and guitarists in particular will find plenty of uses for a Workhorse, adapting its contents for stage or studio use, particularly with Radial's own musician-friendly module range. Recording and ReAmping are particularly well catered for. But there are plenty of other choices when it comes to mixing and matching 500 Series modules. The Workhorse is completely compatible with the whole gamut of available (and obsolete) 500 Series modules. Radial has clearly worked hard to bring more to the party and expand the standard, making a good case for existing 500 Series users to move over to the Workhorse. Radial's design approach is admirable; there is a downloadable Open Source Document on its website detailing the Workhorse's specifications and defining its backward compatibility, and detailing the new busing and Omniport features. Radial optimistically hopes that other 500 Series manufacturers will incorporate these into their modules.

The Workhorse certainly makes a terrific host for modules — sturdily built with useful routing features and extensive connectivity. The summing mixer bus sounds great, and is a huge bonus; its choice of monitoring features provide a useful and compact system for many applications, whether you combine the module racking with the summing mixer, or use them independently of each other. Whichever 500 Series modules you choose, the Workhorse makes a great home for them. ■

#### PROS

Brings the 500 Series concept up-to-date with useful features; warm and pleasant summing; solidly built.

#### CONS

No power button.

#### EXTRAS

The Shuttle 500 Series module was recently released, and it greatly expands the Workhorse's capabilities when interfacing with other gear. It provides two effects loops, one is balanced at +4dB, the other unbalanced at -10dB. A third loop can be accessed via the Omniport, providing a useful way of interfacing with a patchbay. All three are switched from the front panel. Using the Shuttle makes patching and routing non-500 Series gear rather easier, saving the need for complex patchbay connections and enabling such useful functions as monitoring through a recorder. Older 500 Series modules can be placed left of the Shuttle and using the Feed function gain access to the Workhorse mixer bus.



#### Contact

**RADIAL, CANADA**  
Web: [www.radialengineering.com](http://www.radialengineering.com)