

JDX™ 500 Reactor

Amplifier Direct Box & Cabinet Emulator

500 Series Module



User Guide

Radial® JDX™ 500 Reactor User Guide

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Congratulations and thank you for purchasing the Radial JDX 500 Reactor module. The JDX is a unique 500 series amplifier interface designed to capture the dynamic relationship between an amplifier and speaker cabinet while also offering direct instrument recording with active speaker cabinet emulation.

This manual describes installing and operating your JDX 500 in the Radial Workhorse or other 500 series module power racks. To take full advantage of the unique features that have been incorporated into the JDX 500, please read through this manual before using it. This user guide will give you a broader sense of the module's capabilities. If you have questions that are not covered in this manual, please visit the FAQ section on our website. This is where we post answers to questions from users. If you cannot find the answer to your question please feel free to send an email to info@radialeng.com and we will do our very best to respond as quickly as possible.

The JDX 500, one small step for audio engineering, one huge leap for tone fanatics!



WARNING NOTICE TO USER!

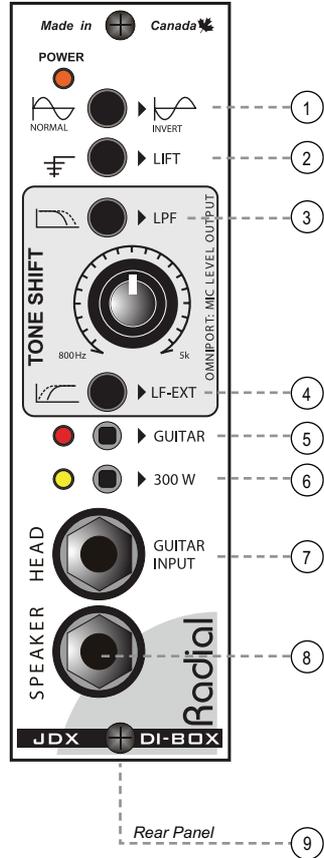
The Radial JDX 500 is not a load box. This means that if you are using it with a guitar amplifier it must be connected to a speaker cabinet or some type of load box. Failure to do so could result in damaging the JDX and your amplifier which of course would not be covered under warranty. Always ensure you have proper cables and connections have been checked. We recommend using high quality 12 gauge speaker cables.

Because the JDX 500 can also be used as a direct input from a guitar, we have instituted a slow flashing LED to let you know when you are in this mode. This safety measure reminds you that you should not connect a guitar amplifier output to the JDX when in guitar mode as this may damage the JDX.

Although preventative safety measures have been designed into Radial 500 series products **we strictly advise against hot-swapping modules** or plugging and unplugging them when the Workhorse or other 500 series rack is powered on. Hot swapping can cause connection sparks at the card-edge connector that could send damaging transients to other equipment. This also greatly reduces the life span of the contacts. Damage due to hot swapping is not covered under warranty. There are no user serviceable parts inside.

FEATURE SET

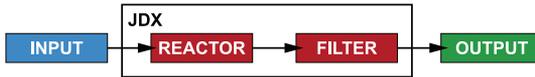
1. 180° REVERSE - Inverts the signal polarity between 0° and 180°.
2. LIFT - Ground lift switch works with the transformer isolation to help eliminate hum and buzz caused by ground loops.
3. LPF TONE SHIFT - Low pass filter control, rolls off the high end to tame the aggressive edge from overly bright sounding amps.
4. LF-EXT - Low frequency extension, lowers the bass frequency response to emulate the sound of a 15" speaker for added bass.
5. GUITAR - Toggles the front panel 1/4" jacks between "amp mode" and "guitar mode". When set to "guitar mode" (inward position) instruments may be connected directly to the 1/4" HEAD jack. The LED indicator flashes when "guitar mode" is engaged. Do not connect an amplifier when the LED is flashing. **Read the user warning notice before using this feature.**
6. 300W - Reduces the input sensitivity to allow high-power guitar and bass amps to be used with the JDx.
7. 1/4" HEAD JACK - Used to connect amps or instruments depending on the position of the GUITAR switch. When the JDx is in "amp mode" this jack connects the speaker output of an amplifier. When the JDx is set to "guitar mode" instrument may be connected directly to this jack. **Read the user warning notice before using this feature.**
8. 1/4" SPEAKER JACK - Used to connect a speaker cabinet when JDx is used with an amplifier. **The JDx is not a load box. Therefore, it must be connected to a speaker or load box when used with a guitar amp.**
9. OMNIPOINT - When installed in the Radial Workhorse rack you will have access to the Omniport 1/4" TRS jack. The JDx Omniport is an alternative output set up as a balanced mic-level direct box to feed a microphone preamp, snake system or mixing console in a live touring setup.



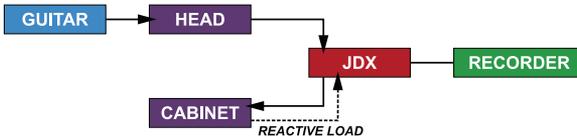
OVERVIEW

The Radial JDX 500 is a 500 series module designed to bring the sound of a guitar amplifier into the recording system without having to necessarily set up microphones or amplifiers. In other words, it is designed as a quick production tool for professionals who make music and record.

Inside the JDX are two different circuits: The first is a reactive load that captures the sound of the head and the back electro-magnetic impulse from the loudspeaker. The second is a series of band-pass filters that shape the tone to create the 4x12 cabinet emulation. To address the problem of overly bright amplifiers, the front panel is equipped with a variable low-pass filter designed to gently remove high end.



There are two basic ways to use the JDX: For the ultimate tone, the JDX can be connected in 'amp-mode' where it is placed between a guitar head and cabinet to capture both the sound of the amplifier and the reactive load of the cabinet.



Alternately, the JDX can be used in 'guitar mode' whereby the amplifier and cabinet are not used. Instead, the guitar is connected directly to the JDX, via some effect pedals, to take full advantage of the advanced multistage speaker emulation filtering. If you have ever tried to record a guitar through an overdrive pedal directly to the recorder you know how unpleasant it can sound. The JDX filtering circuit takes the harshness away by emulating the response of a speaker cabinet. The variable low-pass filter gives you extra control to further shape the tone. Using the JDX in guitar mode is a great approach to laying down quick tracks when writing. Simply connect your guitar to some pedals then into the JDX and you are set to go.



You can also use the JDX as an analogue filter to warm up tracks by sending a pre-recorded track into the JDX via the XLR input. This approach applies to more than just guitar tracks. Sending a synth or bass through the JDX can add mid range punch that can make a track stand out. As always... there are no rules, only guidelines. Have fun. Experiment!



FUNCTION DETAILS

180° Reverse

This switch inverts the signal at the JDX output to align the polarity with a microphone so they may be combined at the mixing console without phase cancellation.



Lift

This ground lift switch works with the transformer isolation to help eliminate hum and buzz caused by ground loops. For the vast majority of amplifiers this switch is set to the inward position (ground lifted). However, some amplifiers may need to have the lift switch set to the outward position (ground not lifted). Try both settings and use the one that eliminates the most noise.



LPF Tone Shift

This variable low pass filter rolls off the high end to tame the aggressive edge from overly bright sounding amps. To engage the filter depress the LPF switch and adjust the TONE SHIFT control for the best high-end response.



LF-EXT

Or Low Frequency Extension, extends the frequency response of the speaker emulation circuit downward to emulate the sound of a 15" speaker for added bass. When the LF-EXT switch is depressed the low frequency cutoff shifts from 200Hz down to 100Hz.

Guitar

This recessed switch toggles the front panel 1/4" jacks between "amp mode" and "guitar mode". When "guitar mode" is engaged this feature allows instruments to be connected directly to the front panel 1/4" HEAD jack for quiet recording without an amp. Engaging guitar mode causes the LED to flash and changes the input sensitivity of the 1/4" HEAD jack to accept instrument level signals. **Do not connect a speaker-level signal to the 1/4" HEAD jack when the GUITAR switch is engaged and the LED is flashing.**



Outward position: amp mode
 Inward position: guitar mode
 (LED flashes)

300W

This recessed switch allows high power guitar and bass amps (up to 300 watts) to be used with the JDX without overloading the output stage. In the outward position the sensitivity of the 1/4" HEAD input jack is set for 100 watt or less amps. When set to the inward position the input sensitivity is reduced to accept 300 watt amps and the LED indicator illuminates.



¼" Head Jack

This front panel jack has two modes of operation depending on the setting of the GUITAR switch:



Out position = amp mode; jack accepts speaker-level signals from an amp.

In position = guitar mode; jack accepts instrument level signal from guitar or pedals. LED will flash when guitar mode is engaged.

¼" Speaker Jack

This front panel jack has two modes of operation depending on the setting of the GUITAR switch:



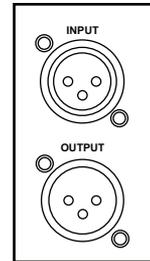
Out position = amp mode; thru-put jack connects amplifier to speaker cabinet.

In position = guitar mode; thru-put jack connects guitar to pedals and amp. LED will flash when guitar mode is engaged.

REAR PANEL CONNECTIONS

XLR Input

When installed in a 500 series rack the rear panel female XLR input jack is used to feed a signal from your DAW through the JDx speaker emulation circuit. This turns the JDx into a unique filter where the TONE SHIFT LPF and LF-EXT controls can be used to shape the sound.



XLR Output

When installed in a 500 series rack the rear panel male XLR output jack produces a balanced line-level signal. This is how the JDx normally outputs the signal to mixing consoles and DAW's.

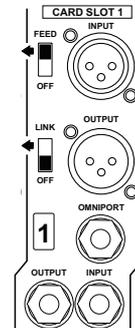
WORKHORSE ENABLED FEATURES

Omniport

When installed in the Radial Workhorse rack you will have access to the Omniport ¼" TRS jack. The JDx Omniport is an alternative output set up as a balanced mic-level direct box to feed a microphone preamp, snake system or mixing console in a live touring setup.

Parallel 1/4" I/O Jacks

When installed in the Radial Workhorse the standard balanced input and output connections are enhanced with parallel ¼" TRS jacks and D-SUB connectors.



GETTING STARTED

Before making any connections, start by turning off your audio system and turning all volume levels down. This helps protect equipment from turn-on transients that could damage loudspeakers and other sensitive equipment. We recommend using a power bar with an on-off switch as this makes it easy to turn on and off the 500 series rack, monitors and so on, using a single switch. Carefully plug the JDX into your 500 series rack to avoid stress on the card edge connector. Screw the module in to ensure it does not accidentally get dislodged.

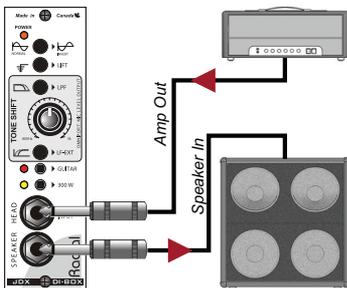
Guitar and amp connections to and from the JDX are made on the front panel while connections to the recording system or PA are done on the rear panel. Most 500 series racks are equipped with XLR connectors. When you plug the JDX into your 500 series rack, it will automatically route the card-slot input and output jacks to the module. With the Radial Workhorse, the I/O is augmented with 1/4" TRS connectors, D-Subs and the Mix Buss signal to feed the Workhorse mixer.

Start by setting up the JDX panel controls as follows:

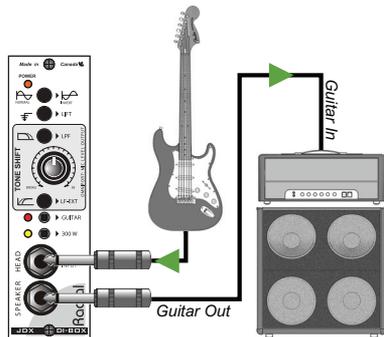
1. 180° POLARITY REVERSE: outward position (in phase)
2. LIFT: inward position (lifted)
3. LPF: outward position (bypassed)
4. TONE SHIFT filter: control fully clock-wise
5. LF-EXT: outward position (normal LF response)
6. GUITAR: outward position (LED not flashing)
7. 300W: outward position for 100 watt or less amps.



Keep in mind that the JDX is not a load box. This means that if you are using high power output devices like a guitar amplifier, the JDX must be connected to a speaker or some form of load resistor. Failure to do so can cause the JDX to blow up into a bazillion pieces and ruin your whole day!



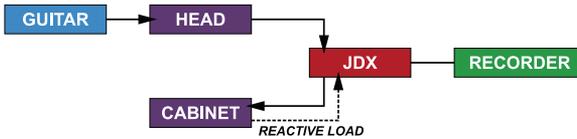
AMP MODE: Speaker-level from amp into JDX and thru-put to speaker cabinet. Speaker load must be connected. Use 12awg. speaker cables.



GUITAR MODE: Instrument input and thru-put to amplifier input. Use guitar cables to connect.

Using The JDX In Amp Mode

This set up is designed to record the sound of your guitar or bass using the JDX without a microphone.



Make sure the GUITAR selector switch is set to the outward position (LED not flashing). Plug your guitar into your amp and connect the head's speaker output to the JDX, then the JDX speaker out to your guitar speaker cabinet. Always use heavy 12 gauge speaker cables to ensure you get maximum signal transfer between the amp head and cabinet. Start by testing your amp to make sure it is working properly. We always recommend testing at low volumes for safety. This can save your ears and equipment from damage.

Connect from the JDX to your recording system using the balanced XLR output located on the rear of your 500 series rack. Start playing. You should be able to hear the sound in your recording system. If you have a Workhorse, turn on the channel module slot. You can then monitor it via the headphones or one of the outputs. If you hear any buzz or hum, try depressing the lift switch. This disconnects the ground connection going to the amplifier.

Extending the bass - The JDX is designed to emulate a 4x12 cabinet. Although this may sound very 'guitar-centric', smaller speakers are often used for bass as it allows the sound to punch through the mix with less of a heavy bottom end. To add versatility, the JDX module is equipped with a LF-EXT or low frequency extension switch that basically widens the frequency response and reaches down further to emulate a 15" loudspeaker. This adds an octave or more to the bottom end to create bigger bass tones. On keyboards, it can be used to fatten up the low end of a Hammond and with today's 7-string guitars, you can descend into the trenches of filth and degradation.

Extending the power - The JDX was originally designed for 100 watt guitar amps. But as we later discovered, many artists began using the JDX with high-power bass amps causing the JDX output levels to be significantly greater than with 100 watts amps. As a safety measure and to reduce the risk of overdriving the output stage, the JDX module has been outfitted with a 300W switch. This introduces an attenuating pad at the ¼" HEAD input to lower the sensitivity.

Playing in phase - Another cool feature on the JDX is the 180° polarity reverse switch. This is used when combining the sound from the JDX with a microphone on the speaker cabinet. Sometimes, by simply reversing the polarity, you can improve the tone dramatically. You can of course take this to a significantly higher level by adding a PhazeQ to this set up. With the PhazeQ's completely variable phase control, you can dial it the perfect tone from mid punch to major crunch!

The Low Pass Filter - Once you start listening to the JDX, you will certainly want to tweak the tone to suit. The variable low pass filter is designed to gently roll off top end and smooth out the tone so that it better replicates the sound of your guitar coming through the amp. Simply depress the LPF switch and then rotate the TONE SHIFT control counter-clockwise (starting at 5:00 o'clock) until it sounds right.

Using The JDX In Guitar Mode

Guitar mode or direct record mode is actually easier than using the JDX in amp mode. It consists of connecting your guitar to the JDX and hitting record. The advantage with this set up is efficiency. All you do is connect your guitar through a distortion pedal like a Hot British™ and you are set to go.

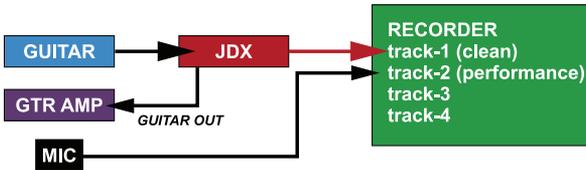


To make this work, depress the guitar switch. This is recessed for safety and is equipped with a flashing LED to let you know that you are in guitar mode. The 'flashing LED light' reminds you that if you intend to use the JDX in amp-mode that you will have to switch this setting to off. In guitar mode, the variable low-pass filter is still available to help shape your tone. Adjust to suit.

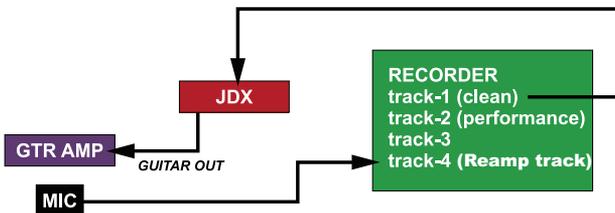
Using The JDX To Reamp

While in guitar mode the JDX can also be used to Reamp™ your signal. This process involves recording a dry track while auditioning the performance using a guitar amplifier. A direct box like the Radial J48, JDV or JDI are often used to record the dry track but the JDX can be used for this too.

To record a dry track with the JDX ensure the polarity and low pass filter are switched out to get the cleanest possible recording. Connect the rear panel XLR output to your recording system. Set the JDX to guitar mode by setting the GUITAR switch to the inward position (LED flashing) and connect the guitar to the front panel HEAD ¼" input. When set to guitar mode, the SPEAKER ¼" output acts as a parallel thru-put allowing an instrument cable to connect to your guitar amp. You can record the amp sound at the same time. The JDX's balanced XLR output on the 500 rack is used to record the clean track.



Once the clean track has been recorded, send it back to the JDX via the rear XLR input where it can then be reprocessed. Set the JDX in guitar mode and use the ¼" SPEAKER jack to drive the guitar amp. You can simultaneously feed other modules and combine them to create exciting effects.



The cool thing about using the JDX for Reamping is that you are shaping the guitar tone to sound more amp-like. This means that you can then later send the prerecorded track to devices like limiters or EQs and you are already half-way there!

Using The JDX For Tone Shaping

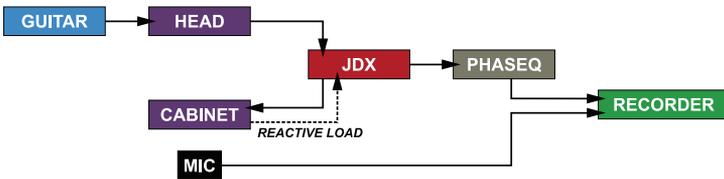
As described above, it is common to record a clean guitar track and then later Reamp the signal by sending it from the recorder to some guitar amps using a device like the Radial X-Amp. You can also use the Radial JDX as a tone shaping tool by sending a pre-recorded track into it via the XLR input on your 500 series rack. This can be used for guitar tracks, keyboard or any number of instruments.



Hook-up is easy. Simply send the track to the JDX, process and then use the XLR output to feed a new track. With the Workhorse, you can add other modules in series for EQ, phase and limiting to create exciting new tones. *Note: When using the XLR input, make sure the ground is in the lifted position (pushed in). This arranges the ground so that both the plus and minus of the balanced input are kept separate and assures a proper balanced input will be introduced.*

Combining The JDX With The PhazeQ

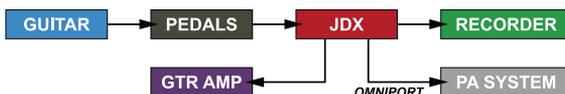
You can create huge guitar tones by combining the direct sound of the JDX with a room mic. When you combine the two, you will invariably find that some frequencies will amplify each other (be in phase) while some will cancel each other out (be out of phase). The PhazeQ lets you fine tune the phase relationship between the direct sound from the JDX and the room mic.



The set up is simple. Because the sound from the JDX is direct (traveling at the speed of electricity) it will arrive to the recorder before the mic'd signal as sound travels much slower through air. We will therefore adjust the phase of the JDX signal to slow it down. Set the levels on your mixer or Workhorse so that the two signals are relatively the same, then adjust the phase to suit. Be prepared for total world dominating tones!

Using The Omniport Direct Out

If you are equipped with a Workhorse, then you have the added benefit of a direct box output via the Omniport. This mic-level TRS balanced output is designed to feed a mic splitter in a live touring set up or can be used to feed a mic preamp input on a mixer. This setup would be ideal for quiet stages where guitar amplifiers are not used such as in a house of worship.



SPECIFICATIONS*

Circuit type: 100% Class-A discrete, transformer coupled
 Frequency response: Custom multistage band-pass filter (speaker cabinet emulation)
 Power requirement: 80mA, +/-16VDC
 Low pass filter: Variable (Tone Shift) from 800Hz to 5kHz
 Low freq. extension: Shifts low frequency cutoff from 200Hz down to 100Hz

Front Panel Jacks

Amp mode: 1/4" HEAD/GUITAR: Speaker-level input for amplifier 100W ~ 300W (selectable)
 1/4" SPEAKER: Parallel connection for speaker cabinet.

Guitar mode: 1/4" HEAD/GUITAR: Instrument-level input, impedance 10kOhms
 1/4" SPEAKER: Parallel thru-put from guitar

Rear Panel (500 Series Rack)

Guitar mode: XLR input: Input impedance 10kOhms
 XLR output: Balanced +4dB nominal

Amp mode: XLR input: Not Used
 XLR output: Balanced +4dB nominal

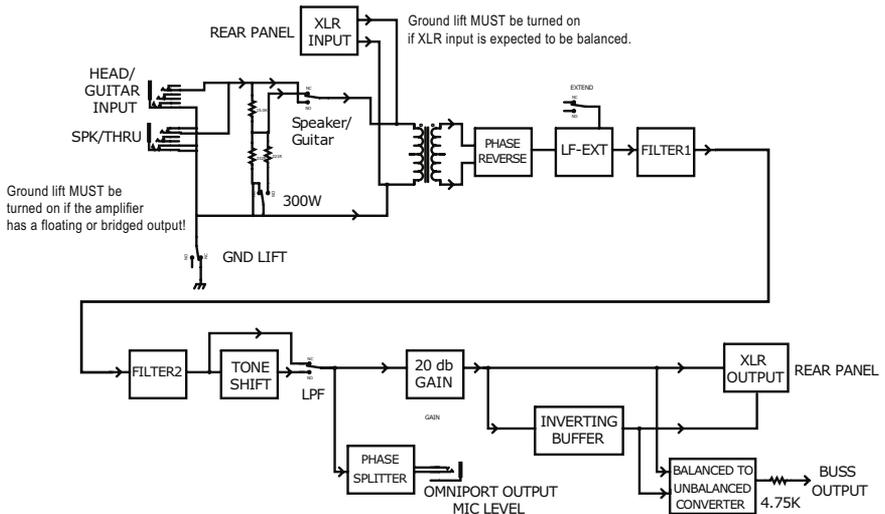
Omniport: 1/4" TRS Balanced, mic-level, 600 Ohms (with Workhorse)

Shipping weight: 1.5 lbs. (.7 kg)
 Size: Standard 500 series rack format
 Warranty: 3 years, transferable

CONNECTOR WIRING



BLOCK DIAGRAM*



* Subject to change without notice.

THREE YEAR TRANSFERABLE LIMITED WARRANTY

RADIAL ENGINEERING LTD. ("Radial") warrants this product to be free from defects in material and workmanship and will remedy any such defects free of charge according to the terms of this warranty. Radial will repair or replace (at its option) any defective component(s) of this product (excluding finish and wear and tear on components under normal use) for a period of three (3) years from the original date of purchase. In the event that a particular product is no longer available, Radial reserves the right to replace the product with a similar product of equal or greater value. In the unlikely event that a defect is uncovered, please call 604-942-1001 or email service@radialeng.com to obtain an RA number (Return Authorization number) before the 3 year warranty period expires. The product must be returned prepaid in the original shipping container (or equivalent) to Radial or to an authorized Radial repair centre and you must assume the risk of loss or damage. A copy of the original invoice showing date of purchase and the dealer name must accompany any request for work to be performed under this limited and transferable warranty. This warranty shall not apply if the product has been damaged due to abuse, misuse, misapplication, accident or as a result of service or modification by any other than an authorized Radial repair centre.

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This product is intended for professional use only.
The user should be familiar and experienced with
the 500 series rack and module format



True to the Music

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