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Radial engineering

JDX 48

Amplifier Direct Box

User Guide

CAUTION: Please read safety disclosure statement on the inside cover before connecting your Radial JDX 48.

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CAUTION STATEMENT

Please read before connecting your Radial JDX 48

THE JDX 48 IS NOT A LOAD BOX

It is mandatory that your amplifier be connected to a loudspeaker or load box at all times. The JDX 48 does not provide a significant resistive load for an amplifier to safely operate. Damage may occur to your amp if the JDX 48 is used without a proper loudspeaker load.

ALWAYS TURN YOUR AMPLIFIER OFF BEFORE CONNECTING OR DISCONNECTING THE JDX 48.

It is your responsibility to confirm the JDX 48 is connected properly before operating your amplifier. If you are unsure about connecting or operating the JDX 48 consult a qualified technician or see your dealer. Damage caused by improper operation is not covered under the warranty. See the back cover for warranty details.

CAUTION - USE OF THE JDX 48 WITH AMPLIFIERS WITH BRIDGED OR BALANCED SPEAKER OUTPUTS IS STRICTLY PROHIBITED.

These types of circuits, typically a type of a Class-D design, are not suited for use with the JDX 48. Using the JDX 48 with them may cause an electrical shock and therefore Radial Engineering Ltd. strictly prohibits use of the JDX 48 with such amplifiers. Please consult the amplifier manufacturer to ensure the power output section of your amp is not designed this way.

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Radial JDX 48 Amplifier Direct Box

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Congratulations on your purchase of the Radial JDX 48 guitar amp direct box, a unique tool for recording and performing with amplified electric guitar. The JDX 48 is an active speaker-level DI that taps the natural tone of your amplifier and interfaces it with professional recording and PA systems.

The Radial JDX 48 is easy to use, however it differs significantly from standard direct boxes. Like any tool, the best way to get the most out of your JDX 48 is by understanding the design, functions and safety features. We recommend you take a few minutes to read this manual before operating your JDX 48.

Should you have any questions regarding the JDX 48 or it's functions check our FAQ at www.radialeng.com. If you would like to share your experience with Radial products we invite you to contact us at info@radialeng.com.

The JDX 48, one small step for mankind, one huge leap for tone fanatics!

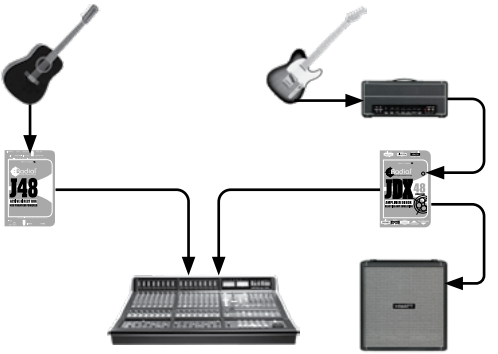
DESIGN CONCEPT

The JDX 48 differs from a standard DI like the Radial J48. A standard DI taps the output of the guitar before it is connected to an amplifier. The JDX 48 taps the output of your amplifier yielding a completely different sound.

The JDX 48 is placed **between** the amplifier and loudspeaker. A proprietary reactive circuit follows the constantly changing interaction between amp and speaker to capture the dynamic response of your amp. Then an active multi-stage filter processes the signal to emulate the frequency response of a loudspeaker and finally, the JDX 48 uses a Class-A buffering amplifier to output a signal suitable for pro-recording and PA systems.

JDX 48 Amplifier Direct Box vs. Standard Direct Box: Bass and acoustic guitars often use a standard DI to capture the clean sound of the instrument. This works because these instruments almost always use an unprocessed sound and the PA system merely amplifies the levels of the direct signal.

Electric guitars generally don't use standard DIs because the amplifier and loudspeaker play an important part in a player's sound. Typically a microphone is used to capture the amplified guitar sound. This raises several other variables such as bleed, placement and acoustics that come along with using microphones.



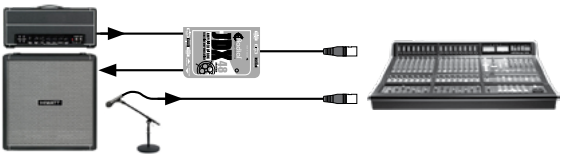
STANDARD DI **MIXING CONSOLE** **JDX 48 AMPLIFIER DI**

The Radial JDX 48 is inserted between the amplifier and speaker cabinet eliminating the microphone and delivering the sound of a player's amp directly to the recording or PA console. By removing the variables of a microphone, the consistency of the sound from night to night is improved. This is a boon to in-ear monitor users. When listening through in-ear monitors subtle differences in mic placement and room acoustics can translate into huge changes in tone. The JDX 48 provides great sound while eliminating bleed from other instruments, like drums, from leaking into the guitar mix.

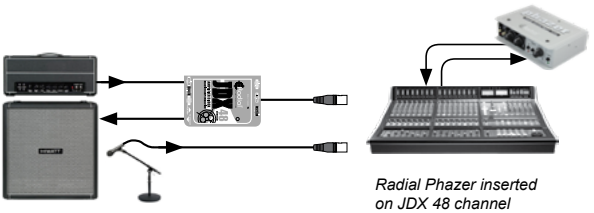
TYPICAL APPLICATIONS

Replace a Microphone with JDX 48: The most basic use of the JDX 48 is to eliminate the need to use an open microphone to capture the sound from the guitarist's amp. The diagram shows the typical connection of the JDX 48.

Using the JDX 48 with a Microphone: Mixing the signal from the JDX 48 with a microphone is a great way to create new sounds. The JDX 48 can also be mixed with a clean direct box signal for a cool effect. For fun, try recording the JDX 48 and microphone to separate tracks that are panned hard left and right.



Using the JDX 48 with the Radial Phazer: When the signal from the JDX 48 and a microphone combine there will inevitably be a small time delay between the signals. The Radial Phazer can be used to time-align the JDX 48 signal with the microphone for fat sounds and effects.



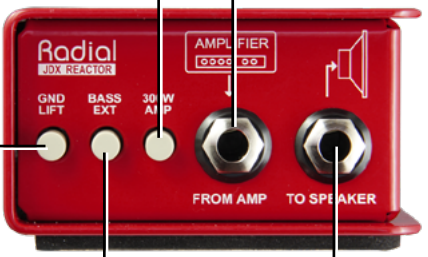
Radial Phazer inserted on JDX 48 channel

FEATURE SET

GROUND LIFT switch eliminates hum and buzz caused by ground loops.

300W AMP select for use with higher wattage amps.

FROM AMP connection for amplifier output.



BASS EXT Boosts bottom end frequencies for bass.

TO SPEAKER connects your amp to the speaker through the JDX 48. **Connection to a loudspeaker or a load box is mandatory. Please read the safety disclosure statement before connecting the JDX 48.**

XLR OUTPUT mic-level, balanced XLR output connects to your mixing console.

BOOKEND DESIGN creates a protective zone around the jacks switches.

CABLE CLAMP Secures cable in place.

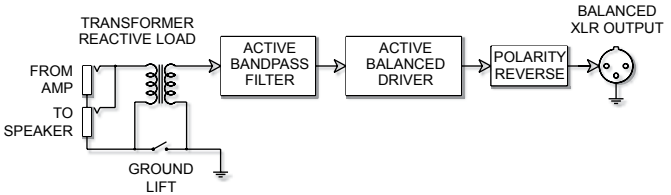
180° POLARITY Reverses pin-2 and pin-3 at the XLR output to phase align the JDX 48 with a mic.

PSU JACK optional connection for the included 15 volt DC power supply.

FULL BOTTOM PAD keeps it from sliding around and provides isolation from electrified amplifier frames and handles.

SIGNAL FLOW

To help you understand how the JDX 48 works take a few moments to trace the signal flow through the block diagram.



Amplifier Input and Speaker Thru-put: The FROM AMP input and TO SPEAKER thru-put jacks are paralleled together and provides the means to patch the JDX 48 in-between the amp output and loudspeaker.

Transformer: The transformer is the front end of the JDX 48 circuit and is used as a reactive load that responds to the various electrical phenomena that dictate how a particular amplifier and loudspeaker sound together. This is what makes the JDX 48 unique when compared to the “load box” approach. A load box simply burns off the excess energy into heat and completely ignores the amp and loudspeaker interaction. By capturing the reactive effect between the amp and loudspeaker the JDX 48 comes closer to the original tone than any other interface system.

The transformer also pulls double duty by electrically isolating the signal passing through it, effectively blocking noise caused by ground loops. This is important because the JDX 48 connects a guitar amplifier to a recording or PA system that may be powered from a different AC main circuit. Without the transformer a ground loop may form that can cause buzz and hum.

Ground Lift: A ground lift switch is provided to further reduce noise caused by ground loops.

Active Bandpass Filter: The analog filter section emulates the response curve of a 4x12 speaker cabinet.

Active Balanced Driver: The output driver in the JDX 48 converts the output to a balanced mic-level signal for driving long cables without signal loss or noise. This JDX 48 output can be patched into typical microphone snakes and be processed along with other microphone signals. The active balanced driver employs a discrete Class-A design for excellent headroom and low distortion.

180° Polarity Reverse: The polarity of the JDX 48 output can be inverted with the 180° switch. Depressing the switch will reverse the signal on pin-2 and pin-3 at the XLR output. The polarity reverse is helpful to phase align two signals when used to interface older "pin-3 hot" equipment that does not follow the AES standard for XLR pin-out.

MAKING CONNECTIONS

The JDX 48 will typically be located near the guitar amplifier to facilitate short speaker cables. We recommend speaker cables be 3m (6') or less in length with a minimum of 16AWG two conductor cable. Longer cables should use heavier gauges to maintain the best power transfer.

Before you begin, ensure your amplifier and PA or recording system are turned off. Lower all the volume controls to minimum to avoid loud transients.

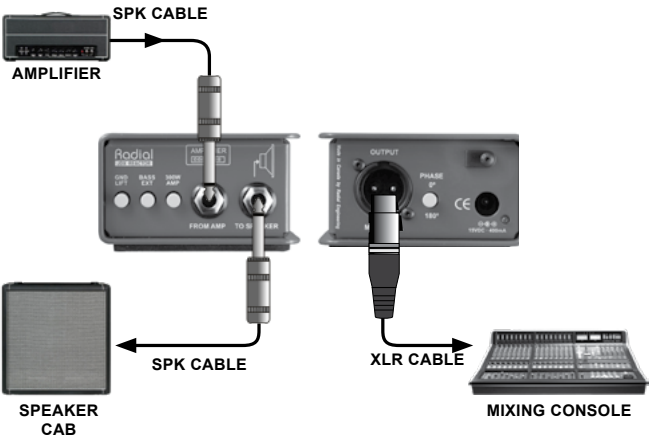
1. Connect your amplifier's speaker output to the FROM AMP ¼" jack on the JDX 48.

2. Connect the SPEAKER ¼" jack on the JDX 48 to your speaker cabinet.

3. Connect the XLR output to a mic preamp input on your mixing console using a standard XLR microphone cable up to 100m (300') in length.

4. Turn on phantom power at your mixer or preamp. If phantom power is not available connect the JDX 48 power supply. Check the LED power indicator to confirm power is present.

5. Turn on your amp and bring up the volume to a low level for testing. Always test at low volume before cranking it up.



USING THE JDX 48

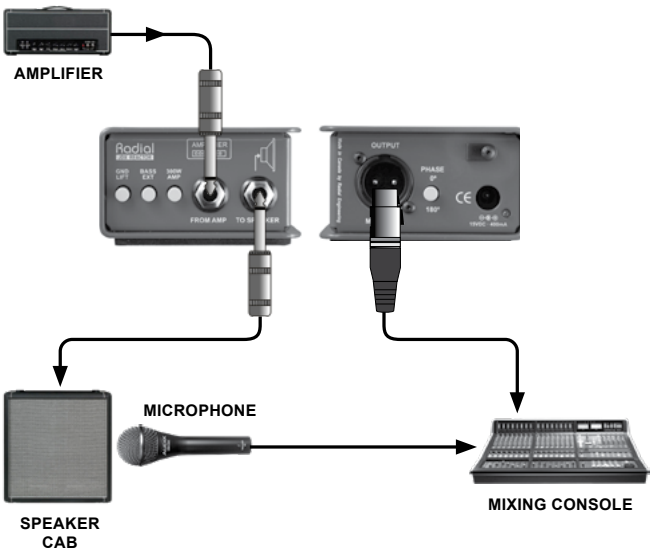
After making connections use your amp and speaker cab as normal and set the amp volume to an appropriate level. Keep in mind that the output level of the JDX 48 (at the balanced XLR) will follow changes to the amp's volume so it's best to set your amp up the way you like it before setting levels at the mixing console.

When your amp is setup, turn up the preamp level at the mixing console. If you notice hum or buzz caused by ground loops, try pushing the GROUND LIFT switch inward. This will isolate the signal ground between your amp the mixing console and eliminate the noise.

MIXING THE JDX 48 WITH A MICROPHONE

Combining the sound of a microphone with the JDX 48 can add greater depth and 'fatten' your guitar tone. The JDX 48 and microphone signals can be mixed together to create rich textures.

After connecting the JDX 48, place a microphone on your speaker cab and connect it to an additional mixing console channel. Set the microphone's preamp level and start mixing the sound from both channels together.



Try moving the microphone around the room to find the sweet spot where the fundamental frequencies or harmonics line up to create a satisfying tone from the two sources. You can also send the JDX 48 signal to the left speaker and the mic signal to the right speaker to create a stereo effect.

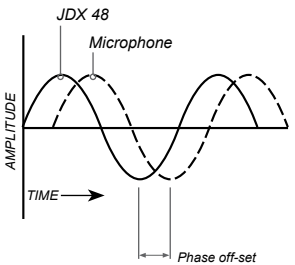
USING WITH THE RADIAL PHAZER

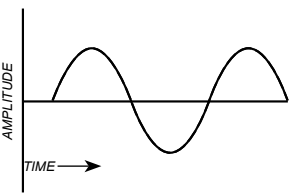
Combining a microphone with the JDX 48 can be very rewarding but to really go all the way, you have to consider the problem you have created by combining both sounds: The signal coming from the amp through the JDX 48 is traveling at the speed of light (via electron flow), while the corresponding sound arriving at the mic capsule via the speaker is travelling at the speed of sound. Thus, the speaker/mic signal arrives later than the direct JDX 48 signal due to the time it takes it to travel through the air. This difference in phase alignment causes cancellation at various frequencies commonly known as 'comb filtering'.

You have to now ‘correct’ the situation by aligning the two signals 'in time' so that their fundamental frequencies are in phase. To make this all work, you will of course need to use two channels on your mixer; one for the mic’ed signal; and the other for the direct feed from the JDX 48. You will also need the Radial Phazer™.

The Radial Phazer is a line level, analogue phase controller that allows you to adjust the direct feed from the JDX 48 so that it is in phase (in time) with the mic’ed signal. Connect the Phazer to your mixing console using the insert point on the JDX 48's channel strip. This can be done with balanced or unbalanced cables or using a typical insert cable with TRS at one end, and two 1/4" plugs at the other. (See the Radial Phazer’s user guide for more details).

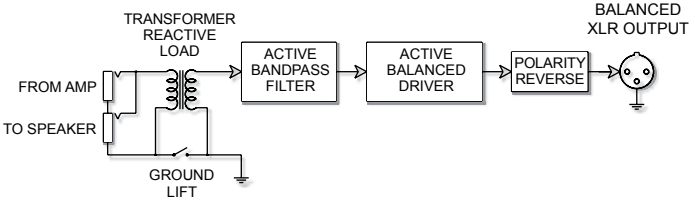
Once connected, simply turn the phase adjustment knob clockwise slowly starting from the left until you find the sweet spot. This will be when the two sounds combine to create a fat rich bottom end. The Phazer makes it easy to phase align the two signals by ear because you can hear the tone change in real time.





JDX 48 and Microphone in perfect time-alignment.

BLOCK DIAGRAM



JDX 48 SPECIFICATIONS

Audio circuit type: . . . . . Discrete Class-A - Transformer Isolated
Frequency response: . . . . . Shaped for guitar use
Dynamic range: 114dB
Noise floor: . . . . . -100dBu below 0dBu
Maximum input: . . . . . 600W @ 4Ω; 300W @ 8Ω; 150W @ 16Ω
Maximum output: . . . . . +14dBu (clip level)
Total harmonic distortion: . . . . . <0.015% (+10dBu input @ 1KHz)
Inter-modulation distortion: . . . . . 0.03% (+10dBu input @ 1KHz)
Input impedance: 15kΩ
Output impedance: . . . . . 2000Ω (XLR out)
XLR configuration: . . . . . AES standard (pin-2 hot)
Power: . . . . . 48V phantom or +15VDC/400mA adapter Included
Construction: . . . . . 14 gauge steel chassis and outer shell
Finish: . . . . . Durable powder coat
Size: . . . . . 5" x 6.25" x 2" (127 x 159 x 51mm)
Weight: . . . . . 2.80lbs (1.28 kg)
Warranty: . . . . . Radial 3-year, transferable

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 a 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 center 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 center.

THERE ARE NO EXPRESSED WARRANTIES OTHER THAN THOSE ON THE FACE HEREOF AND DESCRIBED ABOVE. NO WARRANTIES WHETHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL EXTEND BEYOND THE RESPECTIVE WARRANTY PERIOD DESCRIBED ABOVE OF THREE YEARS. RADIAL SHALL NOT BE RESPONSIBLE OR LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSS ARISING FROM THE USE OF THIS PRODUCT. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS, WHICH MAY VARY DEPENDING ON WHERE YOU LIVE AND WHERE THE PRODUCT WAS PURCHASED.

To meet the requirements of California Proposition 65, it is our responsibility to inform you of the following:
WARNING: This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.
Please take proper care when handling and consult local government regulations before discarding.

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